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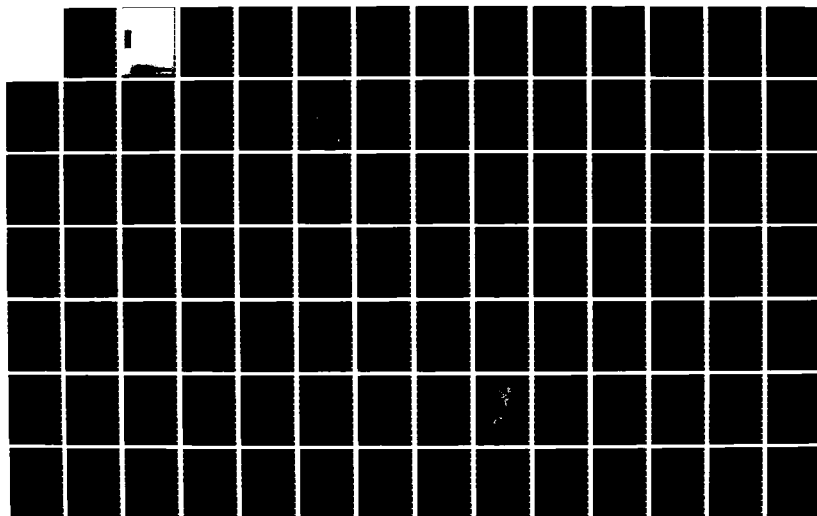
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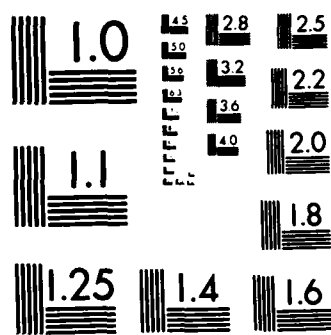
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ALONG THE PAWNEE TRAIL:
CULTURAL RESOURCE SURVEY AND TESTING AT WILSON LAKE, KANSAS

by

Donald J. Blakeslee
Robert K. Blasing
and
Hector F. Garcia

FINAL REPORT
Contract DACW41-85-C-0135
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Kansas City, Missouri

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A cultural resource survey and testing program of the shoreline of Wilson Lake, Kansas, was performed in June and July, 1985. The survey located 58 historic components including petroglyphs, building foundations, check dams, bridges, an abandoned cemetery, and several sets of abandoned farm implements.		

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Forty-nine prehistoric components were found. They include petroglyphs, caves and rockshelters, cairns, campsites, and a burial mound. All sites are of Early Ceramic (Woodland) and Middle Ceramic (Smoky Hill phase) affiliation. Two petroglyph sites are recommended for inclusion in an already existing thematic National Register nomination of petroglyph sites in Kansas.

Geomorphological examination of paleosols exposed in terraces indicated that most of the land surface around the lake is of late Holocene age. Analysis of opal phytoliths indicates a local climatic regime slightly drier than the present for the whole period represented by the alluvial deposits.

The most important feature of the cultural landscape at Wilson Lake and in the regional history is an Indian trail that ran from the Pawnee villages in central Nebraska to the Great Bend of the Arkansas River. Sites associated with the trail include petroglyphs, cairns, and a burial mound. Several historic figures used the trail.

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The study performed herein by the contractor for the Corps of Engineers is called for in the National Historic Preservation Act of 1966 (PL 89-665) as amended by Public Laws 94-422 and 96-515 and is authorized for funding under Public Law 93-291. Accomplishment of this work provides documentation evidencing compliance with Executive Order 11593 "Protection and Enhancement of the Cultural Environment" dated 13 May 1971, and Section 110 of the National Historical Preservation Act.

Funds for this investigation and report were provided by the U. S. Army Corps of Engineers. The Corps may not necessarily agree with the contents of this report in its entirety. The report reflects the professional views of the contractor who is responsible for collection of the data, analysis, conclusions and recommendations.

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ABSTRACT

This volume reports cultural resource survey and testing along the shoreline of Wilson Lake, Kansas, performed in June and July, 1985. The survey documented 95 sites. There are 58 historic components including petroglyphs, building foundations, check dams, bridges, an abandoned cemetery, and several sets of abandoned farm implements. None of these sites were deemed to be of National Register significance.

Prehistoric components found numbered 49. They include petroglyphs, caves, rockshelters, cairns, campsites, and burial mounds. Diagnostic materials were scarce. The sites for which cultural affiliation could be determined were all of either Early Ceramic (Woodland) and Middle Ceramic (Smoky Hill phase) age. One cave and two campsites were tested; none contained any significant deposits. Two petroglyph sites were considered of National Register significance and are recommended for inclusion in an already existing thematic nomination of petroglyph sites in Kansas.

Geomorphological examination of paleosols exposed in terraces at the upper end of the lake indicated that most of the land surface around the lake is of Late Holocene age. This factor helps to explain the lack of any early sites at the lake. Radiocarbon dates for humus in the lowest paleosols at two exposures dated 5090 ± 60 years B.P. (Beta-14135) and 1740 ± 70 years B.P. (Beta-14136). Analysis of opal phytoliths from the alluvial sequence that begins with the oldest soil indicates a local climatic regime slightly drier than the present for the whole period represented by the alluvial deposits.

The most important feature of the cultural landscape at Wilson Lake is an Indian trail that ran from the Pawnee villages in central Nebraska to the Great Bend of the Arkansas River. Sites at Wilson Lake seemingly associated with the trail include petroglyphs, cairns, campsites and burial mounds. Historic figures who used the trail include the Mallet brothers (1739), Pedro Vial (1793), Facundo Melgares (1806), Zebulon Pike (1806), David Meriwether (1820), Charles Augustus Murray (1835), and John Charles Fremont (1853). The trail is obviously important to the history of the region, but more work will have to be done on other sections of the trail and on demonstrating the association of sites with the trail before a National Register nomination can be made.

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The work reported here and the report itself are the accomplishments of many people. Bob Blasing and Hector Garcia coordinated the field and laboratory work. Dr. David May analyzed the geomorphology of the lake, and Steven Bozarth did the opal phytolith analysis. Linda Raftopolous drafted the major maps included in the report. Wanda Sanborn typed and edited the report.

Crew members who worked long and hard in sometimes harsh conditions include Steven Bozarth, Kari Manz, Loy Neff, Linda Raftopolous, Leslie Rounds, and James Wettstaed. People who contributed valuable information about the history and archaeology of the Wilson Lake area include Mrs. Ignace Jones, Mr. and Mrs. Oliver Cooper, Loretta Doubrava, Donald Ginther, Bob Malir, Ernie Masden, the Meitler family, Michael Nyhoff, Virgil Pangburn, Harry O. Schamp, Mark Shaw, Mr. and Mrs. Frank Sibrava, and the staffs of the Fossil Station Musuem in Russell and the Lincoln County Museum in Lincoln. Mildred and Waldo Wedel provided information concerning the identity of the man named Trudeau who left his name carved on a rock near the lake.

Corps of Engineer personnel involved with the Wilson Lake project were all generous of their time and expertise. Dr. William Johnson, Mr. Ralph Brooks, and Dr. Ronald McGregor of the University of Kansas provided valuable assistance in the opal phytolith analysis.

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I.

ENVIRONMENTAL SETTING

Completed in 1964, Wilson Lake provides flood protection and recreation to the Saline River valley of north-central Kansas. The lake holds 9,000 surface acres of water, with a shoreline approximately 100 miles long in Lincoln and Russell counties. As part of its ongoing cultural resource management program, the U.S. Army Corps of Engineers, Kansas City District, contracted for cultural resource survey and testing along the shoreline. This is the report of that project.

Wilson Reservoir is situated on the eastern edge of Russell County and the extreme western edge of Lincoln County, in the north-central portion of Kansas (Fig. 1). It is on the Saline River which is the largest tributary to the Smoky Hill River, entering it from the northwest a few miles east of Salina. These two rivers flow generally eastward, nearly parallel and only a few miles apart in the area of the project. Headwaters of the Saline are in the High Plains of western Kansas.

The project falls within the Smoky Hills subprovince of the Great Plains (Schoewe 1949: 307). The Smoky Hills are bordered on the south by the Arkansas River lowlands, on the east by the Flint Hills, and on the west by the High Plains. The hills of this region were formed from maturely dissected beds of soft sandstone, shale, and limestone. In the immediate vicinity of the lake, the landscape includes gently rolling uplands which are capped with thin beds of limestone and are divided into north-south trending ridges near the Saline River.

Thick beds of Dakota Sandstone are the primary and most noticeable formation around the edges of the reservoir (Kansas Geologic Survey 1964). Steep sandstone cliffs frequently occur adjacent to the major stream valleys. The river valley itself is fairly narrow, with alluvial terraces visible below the dam and near the head of the lake. Elevations around the project area range from just under 1,440 feet at original river level near the dam, to normal reservoir pool level of 1,516 to more than 1,800 feet at points on the upper edges of the drainage.

The presence of shale below the limestone caprock produces springs and seeps in upland swales. These feed numerous ponds and marshes there, which helped to support upland game animals. Springs also occur in the Dakota Sandstone in the bottoms of narrow canyons near the river valley.

Lithic Resources

There are three major geologic units in the project area. Listed from top to bottom, these are the Niobrara, Greenhorn, and Dakota Formations. All are of Cretaceous age. The Niobrara Formation contains the Smoky Hill chalk which is the

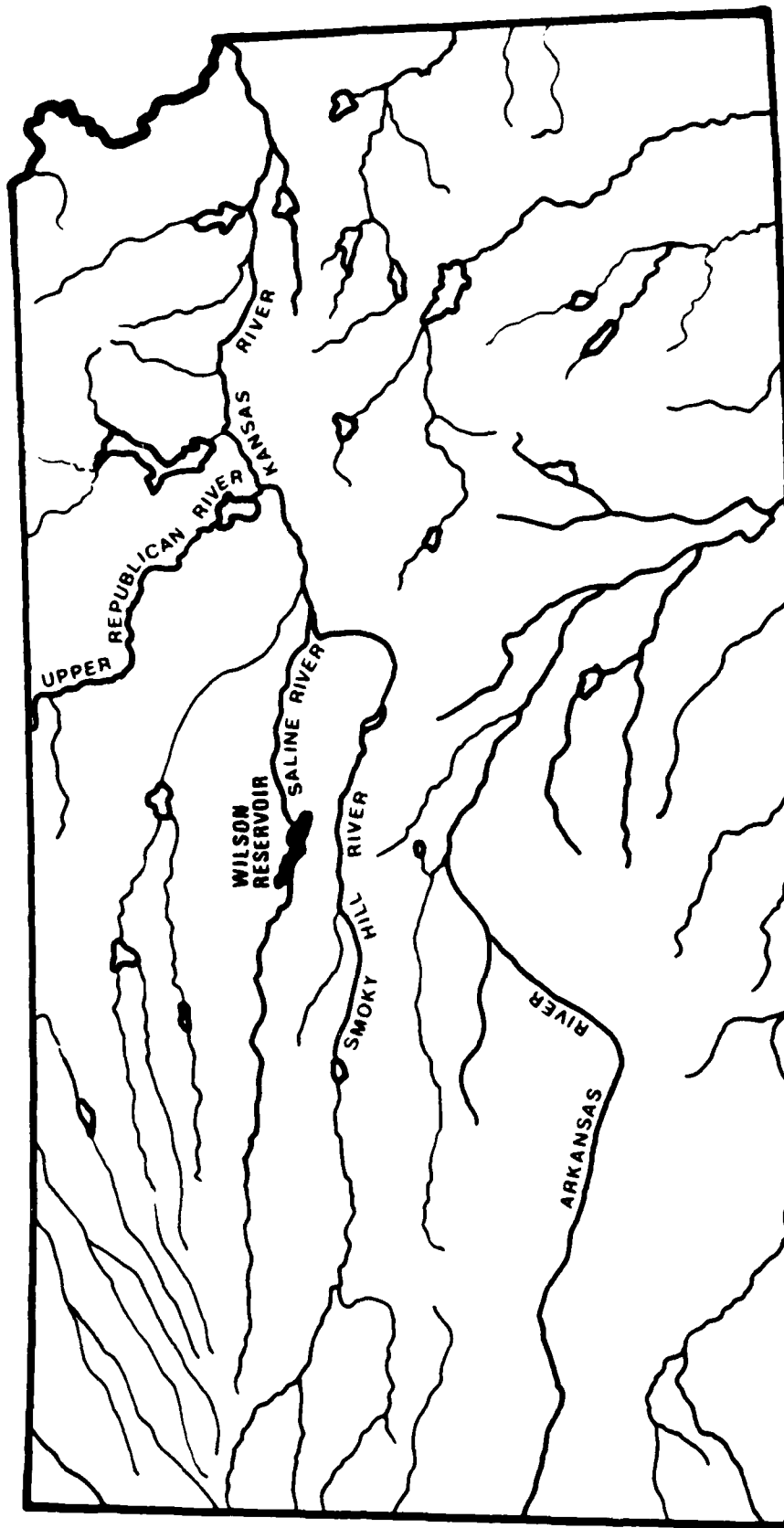


FIGURE 1. Location of Wilson Lake

surface formation to the west. It contains a tabular jasper that was valued by Plains Indians for making chipped stone tools. This material is brown to yellow, with red, white, and black varieties more rare. It is found at Wilson Lake only as occasional small pieces which are in old river gravel deposits on some terraces. A greenish quartzite sometimes caps the Smoky Hill jasper, but this has not yet been observed in the project area.

The Greenhorn Formation consists of thin chalky limestone beds alternating with shales and lignite. The uppermost limestone member in the Wilson Lake area has been used by Euroamerican farmers for fence posts. Abandoned fence post quarries lie just south of Corps property in Sections 20 and 31, T13S, R11W. The lignite beds in the vicinity were mined briefly during the latter part of the 19th century. Selenite crystals are common in some of the shale outcrops around the lake. These may have been used by some of the prehistoric inhabitants to create a white paint (Ball 1941: 4).

The Dakota Formation consists of clays, siltstones, and sandstones. The thick sandstones form picturesque outcrops along portions of the shore of Wilson Lake and provide the caves and rock shelters described in this survey. Native American petroglyphs and modern graffiti are found in this same formation. Well-cemented facies of this sandstone were used by Native Americans for abrading stones such as manos, metates, and shaft smoothers.

Some stream terraces in the area of Wilson Lake contain old river gravel deposits. These are commonly mined for the gravel, especially on the western half of the lake. These gravels contain small amounts of chippable stone which would have been of interest to prehistoric inhabitants. The most common varieties are the Smoky Hill Jaspers mentioned above. Some small specimens of quartzite and petrified wood are also rarely found in these gravels, and chert specimens are extremely rare. Otherwise, the local geology provides few flakable lithic raw materials. Of the few chippable materials seen during this survey, only a small percentage were large enough for making useful tools.

Climate

Wilson Lake lies near the eastern edge of the dry subhumid climatic zone that occupies the western half of Kansas (Thornwaite 1948). This means that potential evapo-transpiration exceeds mean annual precipitation. Potential evapo-transpiration is the water that could be lost from surface soils to the air, both directly through evaporation and indirectly through plant transpiration. Thus, under average conditions, there is a soil moisture deficiency in this region.

Average conditions are not terribly common, however, and there is a considerable amount of temporal and spatial variance

in moisture availability. The spatial variance is determined by the outcrop of aquifers, which are common in the Wilson Lake area. Temporal variation includes both seasonal changes in precipitation, which are fairly predictable, and year-to-year variations, which are essentially random. Seasonally, mean precipitation peaks during the growing season in May and June. This gradually declines to a minimum in December and January (Mandel 1985: figure 3-1).

The mean annual precipitation is 68 cm (26 inches), but the actual precipitation rarely coincides with that mean. A range from 13.6 inches in 1939 to 42.75 inches in 1941 has been recorded at the Ellsworth, Kansas, weather station (Witty 1962: 5). Large year-to-year departures from the mean affect the productivity of both native and introduced plants.

Seasonal variations in temperature are also large, but year-to-year variance is less than for precipitation. The mean annual temperature is 13 degrees Centigrade or 55 degrees Farenheit. The average daily temperature in January is -2 degrees Centigrade or 29 degrees Farenheit, and in July it is 27 degrees Centigrade or 81 degrees Farenheit (Mandel 1985: figure 3-6). The growing season averages about 172 days (Flora 1948: 223-225), though it has been known to range from 141 days to 213 days. Windy conditions are quite common in the area.

Vegetation

During this survey, considerable diversity in vegetation was noted. Generally, the valley areas are covered by mixed grasses with medium species such as little bluestem and cheat grass predominant. Along the river there are communities of tall grasses with big bluestem and Indian grass as well as dense areas of introduced species such as switch grass, Johnson grass, thistles, and sweet clover. On higher uplands and more marginal or heavily grazed areas, short grasses such as buffalo grass and blue grama predominate. At the extremes of moisture, marshy areas around seeps and springs contain cattail, bulrush, sedges, and watercress. Steeper slopes with very little soil frequently are only partially vegetated, with xeric plants such as yucca, prickly pear, and button cactus most common.

Trees usually occur only along the edges of the reservoir and according to local residents were even more scarce in earlier days. The most noticeable groups are those planted for hedge rows and around former house sites. The main species present are cottonwood, willow, ash, elm, hackberry, mulberry, box elder, black walnut, juniper, and tamarisk, with even a few bur oak in places. Kentucky coffee bean and honey locust also occur in spots but are all probably introduced. Obviously introduced species such as Russian olive and Osage orange are common. Brushy areas along the river and on steep slopes consisted mainly of squaw bush, sumac, currant bushes,

and wild plums. Crops commonly grown in the area commonly include wheat, milo, and alfalfa, with devils claw a common weed in these fields.

Edible plants were abundant in the area. Significant amounts of edible roots were provided by purple poppy mallow, prairie turnip, and bush morning glory. Berries were provided by abundant currants, gooseberries, wild sand plums, sand cherries, choke cherries, wild grapes, hackberries, Chinese lantern, and sumac. Prickly pear, rose hips, and buffalo beans provided other fruit. Edible seeds available included amaranth, chenopods, wild sunflowers, and buffalo gourds. Nuts may have been provided by black walnuts and acorns. Edible greens such as sorrel, watercress, sour dock, and cattails were also common.

Change in Vegetation over Time

It is clear that modern land use such as spraying, construction of ponds, oil wells, roads, highways, houses and recreation facilities have affected the modern vegetation distribution. The reservoir itself has provided the biggest change in native vegetation. General Land Office survey notes from the survey in 1867 indicate that the species of trees present at that time included cottonwood, elm, ash, boxelder, oak, walnut, and plum. The extent of wooded areas was clearly less, than today with only scattered timber on the immediate banks of major streams.

The effects of drought on local vegetation have been studied by Albertson and Weaver in the vicinity of Hays, not far west of the project area (1945: 395). They studied the effects of a seven year drought during the 1930's. This was a period of record-breaking temperatures, extremely low humidity, and exceptionally high evaporation rates. They report that the effect was a decrease in the area of woody vegetation, a decrease in the number of species of woody vegetation, and a dwarfing in the size of individuals of those species that survived. Grasses which could compete more effectively expanded their range, while total productivity of all species per unit area declined. Streams that flowed continuously maintained trees along their banks (Albertson and Weaver 1945: 399). In central Kansas, short grass prairie expanded eastward over former mixed grass prairie range (Albertson and Weaver 1945: 451). In a later report (1957: 27) they reported that the drought also caused a change in vegetation because the decrease in growth led to overgrazing, which in turn caused erosion and further damage to plant communities. They point out that the intensity of the effects of such a drought clearly vary from one location to another (Albertson and Weaver 1957: 35).

Fauna

Wildlife is abundant in the project areas today. Reptiles are particularly common around the lake. During the survey, box turtles were common on the higher ground and an abundance of aquatic turtles such as painted turtles, soft shell turtles, and snapping turtles were seen. It was unusual to see any area of sandy beach that didn't have small pits and shells where turtle eggs had hatched. Snakes and lizards were also common with bull snakes, garter snakes, water snakes, rattlesnakes, blue racers, horned lizards, skinks, collared lizards, and race runners most abundant. Amphibians such as bull frogs, leopard frogs, toads, and an occasional salamander were also seen.

Along the shoreline, aquatic species such as clams, crawdads, and an occasional freshwater jellyfish were noted. A variety of pests such as ticks, deer flies, chiggers, wasps, and poison ivy also made themselves evident to the crew during this survey.

Birds were represented in the project area by some 260 species (Cannon 1978). A large variety of small birds such as chickadees, swallows, bluejays, orioles, redwing black birds, sandpipers, gulls, flickers, redheaded and downy woodpeckers were noticed during the survey. Birds of prey such as red-tailed and Swainsons hawks, bald and golden eagles, great horned owls, and others such as crows, kestrels, harriers, nighthawks, and turkey vultures are also found in the area. More important species for aboriginal food sources, such as wild turkey, prairie chickens, sand hill cranes, great blue herons, doves and bob white quail are also common in the area, and probably were in prehistory. Important migratory birds include greater white-fronted and Canada geese, pelicans, mallards, blue and green-winged teal, northern pintails, gadwall, northern shoveler, American wigeon, redhead, lesser scaup, mergansers, buffelheads, and coots.

Mammals in the area (Corps of Engineers n.d.) include a variety of gophers, mice, rats, ground squirrels, shrews, moles, and bats. Larger mammals include white-tailed and mule deer, black-tailed jackrabbits, opossums, eastern cottontails, prairie dogs, fox squirrels, raccoon, mink, long-tailed weasel, skunks, packrats, muskrats, and beaver. Predators such as bobcats, red fox, coyote, badgers, are also frequently found.

The area formerly had populations of larger animals that are now locally extinct. These include bison, elk, and pronghorn antelope, all upland game animals. Bison and elk appear to have been present in very large numbers. One early observer reported a single gang of elk that numbered between 500 and 1,000 (Barr 1908: 11), and the G.L.O. survey notes report a large buffalo herd in Township 12 south, Range 10

west, near the present site of the dam. The reason for these large herds probably lies in the combination of buffalo grass and plentiful springs in the uplands.

J. R., Mead provides a poetic description of the animal life of the region circa 1859:

Over the entrancing land roamed countless numbers of buffalo, elk and deer. Beaver built their dams and sported undisturbed in the rivers and streams. Glossy black turkeys were as common as chickens about a farm house. Eagles soared aloft, and thousands of ravens, a bird peculiar to the plains. There were prairie chickens of two varieties; occasional flocks of quail, of the Texas variety; fox-squirrels in the oak timber; racoons, porcupines, foxes, otter; the lynx, wildcat and panther; badgers and prairie dogs; and everywhere big gray wolves and the musical coyotes, subsisting on the weak and fallen and the hunters' waste. On every side was animal life, and no one to disturb the harmony of nature except the occasional roving band of the red men of the wilderness, who claimed the country as their own. (Mead 1906: 8-9)

Evidence of still larger, now extinct forms are seen in the form of a mammoth tooth from the general area displayed in the Lincoln County Courthouse, and a mammoth tusk from the Tobias gravel pit just northwest of the reservoir.

TABLE 1. MAMMAL LIST FOR THE WILSON LAKE AREA

Common Name	Linnaean binomial
American buffalo*	<u>Bison bison</u>
Elk	<u>Cervus canadensis</u>
Pronghorn antelope	<u>Antilocapra americana</u>
White-tailed deer	<u>Odocoileus virginianus</u>
Mule deer	<u>Odocoileus hemionus</u>
Raccoon	<u>Procyon lotor</u>
Beaver	<u>Castor canadensis</u>
Muskrat	<u>Ondatra zibethicus</u>
Eastern cottontail	<u>Sylvilagus floridanus</u>
Black-tailed jackrabbit	<u>Lepus californicus</u>
Opossum	<u>Didelphis marsupialis</u>
Blacktail prairie dog	<u>Cynomys ludovicianus</u>
Plains pocket gopher	<u>Geomys bursarius</u>
Eastern fox squirrel	<u>Sciurus niger</u>
13-lined ground squirrel	<u>Citellus tridecemlineatus</u>
Franklin ground squirrel	<u>Citellus franklinii</u>
Porcupine	<u>Erethizon dorsatum</u>
Nine-banded armadillo**	<u>Dasypus novemcinctus</u>
Badger	<u>Taxidea taxus</u>
Black bear*	<u>Ursus americanus</u>
TimberWolf*	<u>Canis lupus</u>
Coyote	<u>Canis latrans</u>
Red fox	<u>Vulpes vulpes</u>
Mountain lion*	<u>Felix concolor</u>
Bobcat	<u>Lynx rufus</u>
Mink	<u>Mustela vison</u>
Long-tailed weasel	<u>Mustela frenata</u>
Black-footed ferret*	<u>Mustela nigripes</u>
Striped skunk	<u>Mephitis mephitis</u>
Eastern spotted skunk	<u>Spilogale putorius</u>
Eastern wood rat	<u>Neotoma floridana</u>
Prairie vole	<u>Microtus ochrogaster</u>
Hispid cotton rat	<u>Sigmodon hispidus</u>
Northern grasshopper mouse	<u>Onychomys leucogaster</u>
White-footed mouse	<u>Peromyscus leucopus</u>
Deer mouse	<u>Peromyscus maniculatus</u>
Western harvest mouse	<u>Reithrodontomys megalotis</u>
Plains harvest mouse	<u>Reithrodontomys montanus</u>
Plains pocket mouse	<u>Perognathus flavescens</u>
Silky pocket mouse	<u>Perognathus flavus</u>

TABLE 1. MAMMAL LIST FOR THE WILSON LAKE AREA (CONT.)

Hispid pocket mouse	<u>Perognathus hispidus</u>
Ord kangaroo rat	<u>Dipodomys ordi</u>
Norway rat**	<u>Rattus norvegicus</u>
House mouse**	<u>Mus musculus</u>
Eastern mole	<u>Scalopus aquaticus</u>
Southern short-tailed shrew	<u>Blarina brevicauda</u>
Least shrew	<u>Cryptotis parva</u>
Little brown myotis	<u>Myotis lucifugus</u>
Keen's myotis	<u>Myotis keenii</u>
Big brown bat	<u>Eptesicus fuscus</u>
Red bat	<u>Lasiurus borealis</u>
Hoary bat	<u>Lasiurus cinereus</u>
Mexican free-tailed bat	<u>Tadarida brasiliensis</u>

* = locally extinct

** = recent newcomers

II.

CULTURAL OVERVIEW: ARCHEOLOGY

While knowledge of the archeology of eastern Kansas has accumulated rapidly in the last few decades, the western half of the state, with a few exceptions, remains a terra incognita. In this section of the report, the little that is known of the archaeology of the region around Wilson Lake is summarized. The summary is organized according to the chronological periods defined by the Kansas State Antiquities Commission: PaleoIndian, Archaic, Early Ceramic, Middle Ceramic, Late Ceramic and Historic. When named archeological units are known to occur in the vicinity of Wilson Lake, or there is strong reason to suspect that they occur there, a tabular summary of the cultural unit is included at the end of the chapter.

Paleo-Indian ? to 7,500 B.P.

The first portion of the Paleo-Indian period, here designated the Pre-Clovis (? - 11,500 B.P.) is of hypothetical status. Unlike the Llano materials in the subsequent episode, the purported cultural remains of this period lack consistency from site to site. In spite of efforts to impose order on the sites that have been assigned to this period (MacNeish 1978, 1979), they have little in common with one another.

This is certainly true of the few sites from the Great Plains that have been assigned to this period. There are five of these (excluding sites of historic interest only such as the "Loess Man"): the Shriver, Selby, Dutton, Lamb Springs sites and 14MN12.

The Shriver site (Reagan et al. 1978; Rowlett 1981) is a small site which contains a fluted point component which may be of Folsom affiliation. A TL date of 8690±1100 B.C. is reasonable for such a component, but another date, 12,855±1500 B.C., is not. This date, however, has been used as the date for the base of the Bignell loess at this site. A small assemblage of flake tools from the underlying Peorian loess has been assigned pre-Clovis status (Reagan et al. 1978). In spite of the claims made by Reagan, there is nothing in this bottom assemblage that would be out of place in Llano complex sites, and the possibility that these items filtered down from the Folsom(-oid) component seems not to have been considered. The latter seems possible since the horizontal distributions within the two components is similar, 2) the materials in the lower component are generally smaller than those above them, and 3) they are made of the same varieties of chert.

The Selby site has been reported by Stanford (1979, 1982,

1983). He found a faunal assemblage below a Clovis component that included apparently butchered animals and possibly utilized bones. Evidence for the purported human involvement includes spiral fractures, polish on some bones, and impact fractures. Similar phenomena, however, have been observed on Pleiocene bones located near waterholes (Myers and Voorhies 1980). It is worth noting that the Selby site is located in a playa lake deposit.

The Dutton site represents a stream channel deposit with similarly fractured bone below a Clovis component. A radiocarbon date of $11,710 \pm 150$ B.P. years on mammoth bone suggests an age that is at least minimally pre-Clovis.

The Lamb Spring site, like the Selby and Dutton sites, lacks chipped stone tools but contains a boulder that has been regarded as a bone-breaking tool. A radiocarbon date of $13,140 \pm 100$ B.P. on mammoth bone collagen indicates a pre-Clovis date for the deposit, but the investigators were cautious about claims that the bone "tools" were of human manufacture (Stanford et al. 1981: 25).

Site 14MN12 represents a different sort of situation. There is no doubt that the site is of cultural origin; heated chert flakes of human manufacture were found. What is at question is the age of the occupation. TL dates on three chert flakes ran $12,368 \pm 967$, $42,423 \pm 3311$, and $58,445 \pm 6,838$ B.P. years ago. These dates provided the basis for the pre-Clovis assignment (Rogers 1984: 170), but such a wide spread of dates is not reasonable for a thin (20 cm) single component site in a primary context. It is far more likely that the chert was not heated enough to erase all evidence of geological age in the flakes.

Evidence from the Plains for a pre-Clovis occupation is thus tenuous. The likelihood of finding material of this age near Wilson Lake depends on the geomorphic context. The area to be surveyed includes only lowlands, and a pre-Clovis site would have to be buried in old terrace deposits that happen to be cut by the shoreline. There is no evidence on which one can base a reasonable estimate of what such a site might contain. Careful application of dating techniques is the most likely way that such sites will be identified.

The Llano complex (12,000-11,000 B.P.) lies at the beginning of the uncontested human occupation of North America south of the Laurentide ice sheet. Llano sites contain diagnostic stone and bone tools in association with extinct fauna. The diagnostic tools include fluted Clovis points, mammoth bone shaft wrenches and points, or foreshafts of ivory and bone that have bevelled bases. Other less diagnostic materials include bifaces, blades, burins, end scrapers with graver spurs, and hammerstones. No Llano materials have been found in primary contexts in Kansas, but numerous sites have been excavated in the high plains and Southwest. Very closely

related materials have been found all over the area of North America that was ice-free at 11,000 years ago. Numerous finds of Llano materials in association with mammoth bone have led to a perception of Llano subsistence based primarily on big game hunting. There can be no doubt that large game provided an important contribution to the diet of these people, and evidence at the Colby site (Frison 1976, 1977, 1978, 1982) indicates that cached mammoth meat may have seen them through the winter.

There is a bias in the site record, however, that may give a false impression of Llano subsistence patterns. All of the excavated open sites were found through discovery of the megafauna first, with the associated cultural materials found later. Finding a mammoth bone or one of an extinct bison is apt to lead to further investigation; bones of smaller game are not so readily found nor as apt to lead to excavation. Therefore, it is possible that small game provided a significant but as yet undocumented part of Llano subsistence. Leslie Davis has documented a Clovis-Folsom site with numerous butchered yellow-bellied marmots (Mammoth Trumpet, Vol. 1, No. 1:6).

The Llano complex is followed by Folsom (11,000-10,000 B.P.). This complex is marked by distinctive fluted points with pressure flaked retouch. Other tool types include bifaces, burins, end scrapers, and graters. The animal most frequently found in Folsom sites is Bison antiquus. Other game, including smaller animals, is sometimes represented. Important Folsom sites on the plains include Folsom, Lindemeier, Lubbock Lake, Agate Basin, and Hanson. The Hanson site (Frison 1978) appears to be a winter camp and contains evidence of structures.

In Kansas, Folsom points have been found in widely scattered locations as surface finds. One excavated site, 12-Mile Creek in Logan County, yielded a Folsom-like point in association with bison remains (Williston 1902, 1905; Rogers and Martin 1984). In spite of published statements to the contrary, this does not appear to be a Clovis point (cf. Wedel 1959: 89). Two C-14 dates, 10,245±335 and 10,435±260 years B.P., fit with a Folsom-like point but are not acceptable for Clovis materials on the Plains.

The Plano tradition includes a series of cultural episodes marked by distinctive unfluted projectile points. There appear to be some cultural distinctions between the northern and southern plains at this time. Certain point styles (Golondrina, San Patrice) occur only in the southern plains, and Plainview points are far more common there than in the north. Kansas, with its intermediate location, might be expected to yield examples of both sequences. So far, however, the pattern appears to represent only the northern sequence. Rohn (personal communication) has documented a large number of Paleo-Indian points in Kansas, and other than

a good representation of Plainview points, the specimens he has seen fit very well with the northern sequence. Little represented, however, are the parallel oblique flaked points that occur in the northern mountains and adjacent plains (Frison 1978:34-40) in the latter half of the Plano sequence.

Subsistence studies of Plano cultures have tended to emphasize the spectacular large game kill sites such as Olsen-Chubbuck (Wheat 1972), Hudson-Meng (Agenbroad 1978), and Jones-Miller (Stanford 1978). Other sites, however, such as Lime Creek (Davis 1962) and Allen (Holder and Wike 1949) indicate extensive use of small game as well. The Sutter site (Katz 1971) in Jackson County, Kansas, also yielded small game and some vegetal foods. It appears to date around 7800 B.P., that is, near the end of the Paleo-Indian period. The only other Plano sites reported from Kansas are 14NT604, a badly disturbed Hell Gap quarry (O'Brien 1984b) and 14SG516, a plow zone site that appears to have been a Cody complex campsite (Hovde and Blakeslee 1977).

No PaleoIndian period sites have been reported from Wilson Lake, and none were found in the 1985 survey. Rapid alluviation of the river valley during the middle Holocene is the most likely explanation for this.

Archaic period (7500 B.P. to 2000 B.P.).

This episode is generally divided into Early, Middle, and Late sub-periods. These differ from one region to another on the Plains, and Wilson Lake lies between two regions with fairly well-defined but strikingly different sequences. In the Northwestern Plains (Frison 1978), the Early Archaic dates 7500 to 5000 B.P. and is marked by side-notched lanceolate points. Occupation of the Plains proper is sparse during this period. The Middle Archaic, roughly 5000 B.P. TO 3000 B.P. is marked by the appearance of the widespread McKean complex, which is marked by a variety of point styles and a foraging adaptation. The Late Archaic begins 3000 B.P. and lasts into the Woodland period as defined further east.

The second sequence is that of the eastern Plains border and is summarized by Chapman (1975). In his scheme the Early Archaic begins at 9000 B.P. and lasts to 7000 B.P. It is followed by the Middle Archaic (7000-5000 B.P.), which in this region corresponds to the postulated Altithermal drought. The Late Archaic (5000 B.P.-3000 B.P.) sees the initial introduction of horticulture and ceramics into the Midwest and terminates with the beginning of the Woodland tradition in the Eastern Woodlands.

As stated above, Kansas, and the Wilson Lake area in particular, lies between these regional sequences. Most of what is known of the Archaic cultures of Kansas is derived from the eastern third of the state, and these materials fit best into the eastern sequence defined by Chapman, even though

Kansas archeologists use different time subdivisions (Brown and Simmons 1984:5-1). These are Early Archaic (8000-7000 B.P.), Middle Archaic (7000-4500 B.P.), and Late Archaic (4500-2000 B.P.). The defined phases in eastern Kansas which fit the eastern sequence are Munkers Creek (Witty 1982), Black Vermillion (Schmits 1981), Chelsea (Grosser 1970), El Dorado (Grosser 1973), Nebo Hill (Shippee 1948), and Walnut (Grosser 1973). The Logan Creek phase (Kivett 1962) features medium-sized side-notched points that could fit in either the northwestern plains sequence (as Early Archaic) or in the eastern sequence (as Middle Archaic). Side notching appears as a very widespread phenomenon in the eastern United States after 8000 B.P., and the detailed studies of point morphology necessary to separate different traditions have not been made.

Wilson Lake lies west of the area in Kansas where most of the excavations of Archaic materials have been excavated. It lies east of the area in which McKean complex materials have been reported. Glover (1978) made a study of some amateur collections in southwestern Kansas in which clear examples of McKean-style points occurred. This correlates with the observations of Ludwickson et al. (1981) who see an east-west division in the Archaic cultures of Nebraska, with McKean complex materials well represented in the western part of the state.

Two rock-filled burial mounds have been reported from this area of the state (Reynolds 1981). Both have been assigned to the Late Archaic because there was no associated pottery. No chronometric dates were made, however.

Neither the survey reported here nor any of the previous work at Wilson Lake documented any Archaic period sites. Deep burial of the sites by alluviation is the reason for this.

Early Ceramic (A.D. 1-900)

The Early Ceramic period is the name given in Kansas to the time interval known as Woodland further east. Kansas does not appear to have any representatives of the Early Woodland cultures, however, except perhaps in the northeasternmost corner of the state, as some Early Woodland material has been reported from just across the state line in Missouri. Therefore, the Early Ceramic begins at about the same time as Middle Woodland but lasts through the Late Woodland period.

Within the Early Ceramic time period, two cultural units are generally recognized in Kansas. These are Hopewell and Plains Woodland, with the latter divided into a number of defined phases. There are two competing interpretations of the temporal and cultural relationships between the two. One has Kansas City Hopewell as the earliest of the Early Ceramic manifestations on the Plains, with Plains Woodland as derivative from and partly later than the Hopewellian intrusion along the eastern Plains border. The other model places some

Plains Woodland complexes in the same era as Kansas City Hopewell (i.e., A.D. 1-400), with some Plains Woodland units later than this period. Benn (n.d.), for instance, places the Valley phase (Ludwickson et al. 1981: 121-125) in the Middle Woodland time period for stratigraphic, radiocarbon and typological reasons. Hall (n.d.) likewise assigns this unit to Middle Woodland (i.e., Hopewellian) times and argues that the amount of decoration on Valley ware vessels changes with the age of the site in which they are found.

Manifestations with fairly strong Hopewellian affiliations (Kansas City Hopewell and Cuesta phase) are well documented in Kansas. Kansas City Hopewell sites are found as far west on the Kansas River as the vicinity of Manhattan. Other sites as far west as El Dorado (Grosser 1970) and Great Bend (Monger, personal communication) contain pottery of Hopewellian derivation. By the first model of Hopewellian-Plains Woodland relationships, these sites would be interpreted as Hopewellian occupations. By the other model, they would be seen as evidence for Hopewellian influence on indigenous Plains Woodland groups. Regardless of which interpretation is correct, the presence of Early Ceramic sites with some Hopewellian attributes can be expected in the Wilson Lake area.

The Plains Woodland manifestations that may be of the same age as Hopewell include the Greenwood phase (Witty 1982), Valley phase (Ludwickson et al. 1981: 121-125), and the Keith focus (Kivett 1952). These share a common vessel form (although a second vessel type occurs in the Greenwood phase). This is a fairly narrow cylindrical vessel with a pointed base and minimal constriction at the orifice. Some differences between the Plains Woodland units that share this vessel form, such as lip form and decoration, may reflect sample size and chronological placement of individual sites. Padgett and Blakeslee (1982), for instance, report "fabric" impressed interiors on some Greenwood phase pottery from Butler County, a trait that previously was thought to be distinctive of the Keith focus in western Kansas.

They also report some sand-tempered pottery from the same Greenwood phase site. Typically, the Greenwood phase vessels of the tall conical form are tempered with limestone or calcite. Padgett and Blakeslee suggest that the sand-tempered vessels were manufactured by Greenwood phase people when they were in the Arkansas River Lowland, where limestone and calcite are not available and where the clays may not require a calcium-rich tempering material.

Artz (n.d.) reports a relationship between physiographic regions and the types of tempering materials found in the pottery of various ages in Kansas, including the Early Ceramic. Wares with crushed granite temper are found primarily in the glaciated region where granite is available, and so on. Thus the types of clay and the potential tempering material available have, to some extent, determined the kind of temper

typical of a region in Kansas. Holen (1983) identifies some protohistoric Pawnee hunting camps that yield pottery tempered with crushed and burned bone, rather than with the crushed granite that is typical of the villages where the hunters spent the rest of the year. Apparently, the clays available in parts of western Nebraska and Kansas require a calcium-rich temper, and the bison bone in the hunting camps was a readily available source of such material.

While the availability of both clay and tempering material have shaped the distribution of wares defined in terms of temper, there are three other factors of some significance in this regard. One is the movement of people from one region to another. As Padgett and Blakeslee suggest, this is one way in which vessels of one kind of clay and tempered with one kind of material can end up in a region where neither is available naturally. Blakeslee and Rohn (n.d.: 1261-1263) argue that this is the case in some Early Ceramic sites in Miami County, Kansas.

Other cultural factors include exchange and cultural identity. Trade of ceramic vessels may have contributed to the presence of exotic tempers in various regions, and the Middle Woodland era is known for long distance exchange. Finally, the use of specific temper types for ideological reasons -- perhaps to signal ethnic identity -- may have led some groups to use only a particular material to temper their vessels even though it may have been difficult to obtain at various times in their seasonal round.

The Plains Woodland manifestation closest to the study area is the Keith focus (Kivett 1952). Keith focus sites are small and appear to represent a hunting and gathering adaptation. The single well-reported Keith focus burial site, 14PH4, is the Woodruff ossuary (Kivett 1953). It is not clear whether the ossuary represents the burial spot for a large group (61 individuals were included) or whether it represents the ceremonial reburial of individuals from a small community who died over an extended period of time. The rock-filled mound at Wilson Lake reported by Rowlison (1982:41) may represent an alternative burial mode for the Keith focus. Rock-filled mounds are also known for the Schultz focus (Eyman 1966).

The latter half of the Early Ceramic period is called Late Woodland elsewhere. The Late Woodland chronologies of Nebraska, Iowa, and Illinois are well understood, with the sequence in eastern Kansas less well confirmed (cf. Blakeslee and Rohn in press; Johnson 1984). Reynolds (1979: 75) suggests a temporal placement for the Grasshopper Falls phase of A.D. 500 to 1000, within the period of Late Woodland complexes elsewhere. A clear difference between Middle Woodland and Late Woodland vessels is the switch to the paddle and anvil technique that occurred in the late Woodland period. Unfortunately, most reports do not clearly distinguish between

the attributes associated with cord-paddling (a tendency toward laminated paste, some criss-crossed cord roughening, thinner vessel walls) and those of the earlier rolled cord-wrapped stick method of manufacture (thick walls, crumbly to blocky paste, cord impressions parallel over large portions of the vessel, occasional horizontal "fabric" impressions on the interior). Generally recognizable Late Woodland ceramics do not appear in western Nebraska, Kansas, and Oklahoma, or in eastern Colorado. A non-ceramic occupation may be present, but there is no good documentation for this. It is also possible that the earlier ceramic tradition persists into Late Woodland times here.

Middle Ceramic A.D. 900-1500)

Another possible explanation for the absence of Late Woodland ceramics in western Kansas is that Central Plains Tradition ceramics may have begun quite early in this region. Several authors (Krause 1969; Steinacher 1976; Ludwickson, in press) have suggested that either the Solomon River phase or the Smoky Hill phase begin as early as A.D. 500-700. At least some of Krause's sequence is definitely incorrect (Blakeslee et al. 1982), but he is currently analyzing material from the Sumpter site from the Glen Elder reservoir which may be transitional from Woodland to Solomon River phase (Krause, personal communication).

Witty (1962) reported Smoky Hill components from Wilson Lake, but the differences between Smoky Hill and Solomon River are minimal (Witty, personal communication). Classic Republican phase (Krause 1969) materials may also be present at Wilson Lake. If so, it is likely that they represent a slightly later interval.

Middle Ceramic complexes in this part of the state share a common cultural pattern that includes square earthlodges, a dispersed settlement pattern, globular vessels with direct or collared rims, side-notched projectile points, end scrapers, diamond-shaped bevelled knives, and a variety of bone tools. Subsistence included some horticulture as well as hunting and gathering.

The 1985 survey and earlier projects found both grog-tempered and sand-tempered Middle Ceramic pottery. The grog-tempered ware is consistent with a Smoky Hill phase affiliation. The sand-tempered pottery could be either Smoky Hill or Upper Republican.

Late Ceramic, A.D. 1500-1850

In the Late Ceramic period, several cultural traditions are represented near Wilson Lake. The Great Bend Aspect (Wedel 1959) includes three major settlement clusters in Kansas. Sites of one of these, the Little River Focus,

contain sizeable amounts of brown Niobrara jasper. The known quarries of this material lie northwest of Wilson Lake, and the Little River villages lie to the southeast. Camps of Great Bend affiliation can therefore be expected in the region. They can be identified by the distinctive pottery or by the lithics, and several such sites at Wilson Lake are reported here.

At around A.D. 1700, western Kansas, western Nebraska, and eastern Colorado were occupied by semi-horticultural Apache groups who left the archeological remains called the Dismal River Aspect (Gunnerson 1960). There are few excavated Dismal River sites in Kansas. The best known is the Scott County Pueblo, 14SC1, in which Dismal River materials are mixed with Puebloan remains.

At a slightly later period, the Wilson Lake area is known to have been in the bison hunting territory of the South Band Pawnee (Holen 1983). Sites of this group should be marked by a variant of Lower Loup pottery that has been called "Birdwood" and by the presence of Florence D chert from the northern Flint Hills (Blasing 1984). Florence D chert is present in a number of the sites reported here, but Lower Loup pottery is not.

Shortly after A.D. 1800, nomadic equestrian tribes occupied the high plains (cf. Blakeslee 1975). Those whose remains might be found in the Wilson Lake area include primarily the Southern Cheyenne, Southern Arapaho, Kiowa, and Kiowa Apache. It is unlikely that the archeological remains of these groups could be distinguished from one another; all should be marked by a combination of trade goods and stone tools. The landscape around Wilson Lake may have made it attractive as a winter camping area. Locations close to sources of firewood and water that are protected by bluffs would be prime locations for such camps. These would be located in the side valleys, outside the survey area.

At about the same time as this, the area slightly to the east of Wilson Lake was Kansa hunting territory. The archeological expression of this use is the White Rock aspect in Jewell County and the Glen Elder complex in Mitchell County (Marshall 1967; Rusco 1960). Some of the sites are hunting camps; they bear the same relationship to Kansas village sites as the Birdwood culture does to Pawnee. Village sites are also present. Village sites are also present. They are marked by Oneota-like pottery and Flint Hills cherts.

The Wilson Lake area was traversed by the Pawnee Trail, which was used almost constantly during this period. How much older it might be is not known. Historic use of the trail is documented in a later chapter. Here it is appropriate to note, however, the apparent relationship of various kinds of archaeological sites to this and other trails. We were shown the exact position of the trail at Wilson Lake by Mr. Oliver

Cooper. It ran down the east side of a small valley which contains a burial mound, springs and petroglyph sites. On the far (south) side of the Saline River, there are a number of stone cairns placed in positions that would have guided travellers out of the river valley to the trail on the high ground there. The bulk of the archeological sites recorded by earlier surveys are concentrated in this part of the Wilson Lake area.

In the Flint Hills, Bob Blasing (1985) has been investigating another Indian trail. His work has been in the Deep Creek locality south of the Kansas River in the vicinity of Manhattan. The trail there appears to be associated with burials, cairns, campsites and quarries. Proof that a particular site is truly associated with a trail is apt to be very difficult, however. Suggestions for further study of this sort of problem are made later in this report.

The Late Ceramic period is one in which considerable amounts of Southwestern trade materials are found, including ceramics, tubular pipes, obsidian, and turquoise. Provenance studies of these materials would allow tracing of specific trade ties to begin (cf. Kessell 1979). The petroglyph site at Wilson Lake illustrated on the cover of Witty's (1982) report belongs to the Late Ceramic period.

Historic Period A.D.1541-present

The historic period archeology of the region around Wilson Lake is poorly known, but there is a wealth of documentary evidence. For that reason, the little that is known of the archaeology has been summarized in the accompanying tables, and the archeological context of the units summarized has been incorporated into the following section of the report.

TABLE 2. SUMMARY OF THE LLANO HORIZON

Alternate Names: Clovis

Economy: All available evidence points to a big game hunting focus, although smaller game was almost certainly sought. Elephants (mammoth and mastodon) are the more frequently found, but this may be at least partially the result of the visibility of elephant bones. Giant bison were also hunted, but other extinct members of the late Pleistocene megafauna are rarely found in Clovis sites. Storage of frozen meat over the winter in caches has been proposed for the Colby Site (Frison 1978).

Settlement Pattern: Basically unknown. Kill sites are often associated with water, but few campsites have been investigated to determine any definite pattern. Band-sized societies are probably the creators of Clovis sites.

Architecture: Basically unknown in the western United States.

Disposal of the dead: The Anzick Site in Montana yielded the remains of two individuals associated with red ochre, bone points, and a cache of blades.

Ceramics: None are found in Clovis sites.

Lithics: The single diagnostic item is the fluted Clovis point. Other stone tools include true blades, bifacial knives, end scrapers, and graters.

Bone, Antler and Shell: A mammoth bone shaft wrench was recovered from the Murray Springs Site. Several other sites have yielded beveled objects of bone that have been variously interpreted as points or foreshafts (Frison and Ziemens 1980: 234; Lahren and Bonnicksen 1974).

Trade and contact: Due to their apparently high mobility, Llano people often left exotic cherts and other stones at their campsites and kill sites.

Ancestry, subunits and other relationships: The ancestry of Llano is unknown. No subdivision of the unit has been attempted in the region around the project area. Named variants of the Clovis point (Debert, Cumberland) exist east of the Mississippi River.

Environment: The Late Pleistocene provided milder and moister conditions than today. Llano sites are found in all of the major physiographic regions of the area.

Time period: 11,400-11,000 years B.P. west of the Mississippi River. Haynes (1970) finds that all buried Clovis deposits in

TABLE 2 (cont.) SUMMARY OF THE LLANO HORIZON

Major Sites: The Twelve-Mile Creek Site has been called Clovis (Rogers and Martin 1984), but the evidence for this affiliation is moot. The Diskau Site in northern Riley County has seven Clovis-like points and one that looks more like Folsom, along with several spurred end scrapers and gravers. This site is badly deflated and somewhat mixed with an Archaic component. A large percentage of the artifacts are made from non-local materials. All other Llano materials from Kansas have been surface finds. Important excavated sites on the Great Plains include Blackwater Draw (Wedel 1961: 56), Domebo (Leonhardy 1966), and Dent (Wedel 1961: 55).

Range: All of North America south of the continental ice sheets.

References: Frison 1978, Haynes 1973.

TABLE 3. SUMMARY OF THE FOLSOM COMPLEX

Alternative names: Lindenmeier

Economy: Big game hunting with drives and traps. Specialized in the large, extinct forms of bison, along with other game.

Settlement pattern: A highly mobile population with small, short-term camps.

Houses: There is some evidence for circular structures of some sort at the Hanson site, a winter camp in Wyoming.

Disposal of the dead: Unknown.

Ceramics: None are found with this unit.

Stone tools: The diagnostic fluted Folsom projectile point with pressure-flaked retouch is the best known item. Other artifacts include bifaces, burins, end scrapers and graters.

Bone, antler and shell tools: The Lindenmeier site produced bone needles, beads, discs, rib tools and other decorated bone (Wilmsen and Roberts 1978). The Agate Basin site produced three bone projectile points.

Trade and contact: Diverse lithic raw materials at many sites indicate high mobility, trade, or both.

Ancestry, subunits, and relationships: Probably derived from Llano.

Environment: Warming from the Llano period, but still somewhat cooler and more moist than today.

Time period: Radiocarbon dates fall in the period, 10,750-10,000 B.P.

Major Sites: Calabrese (1967:3) reports a surface find of a Folsom fluted point from 14MH75 in Marshall County, Kansas. Wedel (1959: 537) reports similar finds from Doniphan County and near Liberal. Solecki (1953: 16, Fig. 6) reports one on Tuttle Creek Lake. The Twelve-Mile Creek site in Logan County has a Folsom-like point in association with extinct bison remains (Williston 1902, 1905; Rogers and Martin 1984). Important sites in the general region are Lindenmeier in northern Colorado, the Folsom and Blackwater Draw sites in New Mexico, the Agate Basin and Hanson sites in Wyoming, and the Lipscomb and Lubbock Lake sites in Texas.

Range: Widespread on the western Great Plains and the Southwest; rarer on the eastern Plains.

References: Frison 1978; Irwin-Williams et al 1973; Wilmsen and Roberts 1978.

TABLE 4. SUMMARY OF THE PLANO TRADITION

Economy: Big game hunting mixed with some collecting. There is evidence that drives, jumps, pounds and traps were used to obtain large numbers of bison at a time.

Settlement Pattern: A highly mobile population with small, probably short-term camps.

Houses: Small circular or oval outlines of post molds were found in the Midland and Agate Basin levels at the Hell Gap site in Wyoming and a circle of stones was found in the Frederick level. These appear to represent winter houses.

Disposal of the Dead: Little is known for this tradition. One site at Gordon Creek in Colorado (Breternitz et al 1971) has a flexed individual on her side buried in a pit and covered with red ocher. Several stone tools and elk tooth ornaments made up the grave goods.

Ceramics: None are found in this tradition.

Stone tools: This tradition is marked by a series of unfluted point styles. These include Agate Basin, Hell Gap, Alberta, Eden, Scottsbluff, Firstview, and other styles. The rest of the stone tools reflect hunting, butchering and skin working primarily.

Bone, antler, and shell tools: Elk tooth ornaments in a burial. Awls and needles have been found in some sites.

Trade and contact: Stone tools are frequently of exotic cherts, indicating either high mobility or trade or both.

Ancestry, subunits, and relationships: Plano points differ from the preceeding styles in that they lack fluting. This makes derivation from the earlier styles difficult to trace. In this time period, several point styles may overlap chronologically.

Environment: Warming and drying from the preceeding Folsom period.

Age: 10,000 to 7,500 B.P.

Major sites: In Kansas, 14NT604, a badly disturbed Hell Gap quarry site has been reported (O'Brien 1984). Site 14SG516, a plowzone site, yielded a broken specimen of what may be a Scottsbluff point. The Sutter site in Jackson county appears to date to the end of the PaleoIndian period (Katz 1971). Reichart (1981) has reported a buried site on the Delaware River which has not yet been adequately tested, and an Agate

TABLE 4 (CONT.) SUMMARY OF THE PLANO TRADITION

Basin point was reported from the surface at 14PO358 on Tuttle Creek. Site 14RY303, near Tuttle Creek Lake in Riley County, and 14BT402 in Barton County have also been reported to contain Plano material. Plainview points have been documented in Doniphan County (Wedel 1959: 537) and at Tuttle Creek Lake (Solecki 1953: 16). The Casper and Hell Gap sites in Wyoming, Olsen-Chubbuck in Colorado, and the Allen, Lime Creek, Red Smoke, and Hudson-Meng sites in Nebraska are important sites in neighboring states.

Range: All of the Great Plains and portions of the Southwest and prairie peninsula.

References: Agenbroad 1973, 1978; Breternitz et al 1971, Davis 1962; Frison 1974, 1978; Stanford 1978; Wedel 1959; Wheat 1971; Yapple 1968.

TABLE 5. SUMMARY OF THE SCHULTZ FOCUS

Alternate names: Although there are no alternate names for this unit, the meaning of the name has been changed in a fundamental way by O'Brien as compared to Eyman.

Economy: Although still heavily dependent on hunting and gathering, this group apparently used horticulture for part of its subsistence.

Settlement pattern: Small villages or hamlets have been reported (Rager and O'Brien 1980: 30-31).

Houses: Unknown.

Disposal of the dead: At least some of the dead were buried in small mounds 20 to 40 feet in diameter and up to 4 feet high. The mounds contain one or more basins with pits of apparently defleshed, broken and burned bone in them. The burning occurred outside the burial mounds. Grave goods are not abundant, but include projectile points, bone beads and broken pottery (O'Brien 1984: 51).

Ceramics: Pottery has notching on the lip, straight rims, and grit (or occasionally limestone) temper with smoothed to polished surfaces.

Stone tools: Small corner-notched Scallorn points and round end scrapers are typical.

Bone, antler and shell tools: Incised bone beads are present.

Trade and contact: Unknown. The unit as originally defined by Eyman appears to have included burials from other time periods.

Ancestry, subunits and relationships: The unit includes traits of both Plains Woodland and Hopewell.

Age: Early Ceramic period, A.D. 1-700.

Major sites: The Elliot Site, a multicomponent site is reported by O'Brien et al (1973) and by Sorrell (1975). Site 14GE41 is reported by Parks (1978).

Range: Riley, Geary, Clay and Dickinson counties.

References: Eyman 1966; O'Brien 1972, 1984: 50-54; O'Brien et al 1973, 1979; Parks 1978; Phenice 1969; Rager and O'Brien 1980; Witty 1982: 216.

TABLE 6. SUMMARY OF THE KEITH FOCUS

Economy: Somewhat more settled than the preceeding Archaic period, possibly with a small amount of horticulture to supplement the basic hunting and gathering pattern.

Settlement pattern: Small villages covering no more than a couple of acres, although they usually have thick cultural deposits.

Houses: Circular basins with central hearths are reported by Kivett (1952).

Disposal of the dead: The dead were probably first placed on scaffolds and later placed in ossuary pits. Large quantities of shell and bone beads were used as grave goods.

Ceramics: Harlan cord-roughened pottery, which is tempered with calicte, is the ware for this unit. Vessels are tall and subconical with pointed bases. Some exhibit rolled cord impressions (so-called fabric impressions) on the interior.

Stone tools: Large and occasionally small corner-notched projectile points are the most diagnostic tools. Blocky end scrapers are also found.

Bone, antler and shell tools: Many bird bone and shell beads have been found in burial contexts.

Trade and contact: Unknown.

Ancestry, subunits and relationships: Wedel lists the Keith focus in the Orleans Aspect of Plains Woodland. "Fabric" impressed vessel interiors have also been found on Greenwood phase pottery.

Environment: High Plains.

Age: Early Ceramic period. There is a radiocarbon date of A.D. 611 \pm 200 at the Woodruff Ossuary.

Major sites: Woodruff Ossuary, 14PH4, Pottorf B site, 14LA1, and the Young burials, 14SC2.

Range: Western Kansas and Nebraska.

References: Bowman 1960; Kivett 1949, 1952, 1953; O'Brien 1984: 50-54; Strong 1935: 116-122; Wedel 1934: 174-179, 1959: 552-553, 619; Witty 1966, 1982: 217.

TABLE 7. SUMMARY OF THE SMOKY HILL PHASE

Alternate Names: none

Economy: Subsistence was derived from a mixture of hunting, horticulture, and gathering. Cultigens include corn, beans, squash, and sunflower. A wide range of species were hunted, but bison, deer, and elk appear to have provided the bulk of the meat.

Settlement Pattern: Isolated lodges, loose hamlets, and rare villages (e.g., the Minneapolis Site) occur. The extent to which houses in hamlets and villages were contemporaneous has not been determined.

Architecture: Square to rectangular earthlodges range widely in floor area. Four central support posts surround a hearth. Wall posts are often irregularly spaced. Extended entryways and subfloor caches are ubiquitous features. Shallow floor pits seem to have been the norm, with the results that lodge ruins often appear as low mounds rather than depressions.

Disposal of the dead: Partially to completely flexed individual burials were recovered at the Whiteford Site (Whiteford 1937, 1941). Grave goods included small pottery vessels, sherds, chipped and ground stone tools, and shell beads and pendants. A very small portion of the human bone exhibited some charring.

Ceramics: Smoky Hill pottery includes sand-tempered jars with constricted necks and unthickened or collared rims; grog and burned stone temper occur. Vessels are usually cord roughened and seldom decorated. Coconut-shaped jars which lack rims also occur, but are rare. Shell-tempered low-rimmed vessels often with incised shoulder decoration occur in some sites.

Lithics: Points include triangular side-notched and unnotched forms. Other chipped stone tools include lanceolate and diamond-beveled knives, end scrapers, and celts. Ground stone items are flat grinding slabs, "nutting stones", manos, arrow shaft abraders, celts, and elbow pipes.

Bone, Antler and Shell: Bison scapula hoes, digging stick tips, awls, ulna picks, deer metapodial beamers, deer mandible sickles, shaft wrenches, and beads occur. The Whiteford Site has yielded shell disc beads, tapered pendants, and a few barrel-shaped beads.

Trade and contact: Smoky Hill blends at its boundaries with Upper Republican, Nebraska Phase, and Pomona.

TABLE 7 (cont.) SUMMARY OF THE SMOKY HILL PHASE

Subdivisions: It is clear that there is a great variability in what has been termed Smoky Hill. At this point it remains as a unit, but with unclear relationships internally, or with Pomona, Nebraska, and Loup River Phases.

Environment: Sites of this phase are found on terraces and bluffs along major and minor streams in the Loess Plains and McPherson Lowland. Most of these streams would have supported sparse gallery forest.

Age: A temporal span of from circa A.D. 900 to 1300 is suggested by scattered radiocarbon dates. The northerly sites, whether or not they are appropriately lumped in Smoky Hill, are in this range.

Major Sites: Important excavated sites include the Minneapolis Site (Wedel 1935; Witty 1974); the Whiteford Site (Wedel 1959); and the Griffing Site (Wedel 1959). O'Brien has excavated 14GE105, which contained both Woodland and Smoky Hill burials, and the Witt Site, 14GE600, which contained a single lodge. Witty (1962, 1963) has excavated the Root and Woods Sites. The Budenbender Site (Johnson 1973) contains a lodge which yielded a significant amount of shell-tempered pottery, as have the Miller and Rush Creek Sites (Sperry 1965).

Area: As originally defined, this phase included an area surrounding the junction of the Smoky Hill and Solomon Rivers, and the junction of the Republican and Kansas Rivers. It extends north into Nebraska on the Blue River and its tributaries and along streams tributary to the Missouri River (Steinacher 1976; Blakeslee and Caldwell 1979). Similar materials may also extend along the Arkansas River and Little Arkansas River as far south as northern Oklahoma (Galm 1979).

References: Wedel 1959: 539, 563-566.

TABLE 8. SUMMARY OF THE UPPER REPUBLICAN PHASE

Alternate Names: Solomon River Phase, Classic Republican, Upper Republican Variant.

Economy: Subsistence was provided by a mix of hunting and horticulture; game animals included a very wide range of species, suggesting heavy use of floodplain species such as white-tailed deer. Upland species such as bison also were represented, but not to the extent that is true of later sites. Wild vegetable products were also gathered. Maize, beans, squash, and sunflowers were cultivated.

Settlement Pattern: Isolated lodges, small hamlets of up to ten lodges and camps lacking evidence of earthlodges are found. It is not certain that all of the lodges in the hamlets and villages were contemporaneous. The western camps may be the remains of seasonal hunting expeditions.

Architecture: Square to rectangular earthlodge with central fireplace and four support centerposts.

Disposal of the Dead: A number of Upper Republican ossuaries have been excavated, and these sometimes have been associated with individual burial pits in which the bodies were kept until reburial in the ossuary. Pots, potsherds and other artifacts (sometimes exotic) were also included in the ossuaries as grave goods (Strong 1935).

Ceramics: Most Upper Republican vessels are sand-tempered globular jars. Rim forms include both unthickened and collared rims. Decoration is usually confined to the lip of unthickened rims and to the face and base of collars. Collar face decoration is usually trailed, and the dominant motif is composed of horizontal parallel lines. Collar bases are pinched or tool impressed. Body surfaces are normally smoothed-over cord roughened. Handles and lugs, common in the Nebraska Phase, are usually lacking. A few ceramic pipes occur.

Lithics: Upper Republican chipped stone tools include small triangular unnotched and side-notched points, drills, perforators, gravers, spokeshaves, bevelled and unbevelled knives, and end scrapers. Most of these are made from locally available jasper. Ground stone items include (rare) celts, elbow and pebble pipes, shaft smoothers and other abraders, and hammerstones.

Bone, Antler, and Shell: Bone implements include scapula hoes, scapula cleavers, other scapula knives, shaft wrenches made from long bones (less commonly from ribs), bison ulna picks, (rare) metapodial fleshers, metapodial and other awls, and fishhooks. Antler tools include tine flakers, cylinders, shaft straighteners, and bow guards. Shell items include beads,

TABLE 8. (cont.) SUMMARY OF THE UPPER REPUBLICAN PHASE

pendants, and scrapers.

Trade and contact: There are scattered finds of objects suggestive of Caddoan contacts.

Ancestry, subunits and relationships: Upper Republican, as a taxonomic unit, has had a checkered history (Ludwickson 1975, 1978). As the term was originally used, Upper Republican referred to both the materials described here and those we call Loup River Phase (Strong 1935; Champe 1936). The term was later extended as the Upper Republican "Regional Variant" to include what is now called Solomon River Phase as well (Krause 1969). Temporal subphases within Upper Republican as we define it, may eventually be justified (cf. Ludwickson 1979), but the current definition (Ludwickson, in press) supplies none.

Environment: Sites of the phase are found on the high plains and loess plains physiographic provinces of Colorado, Kansas, and Nebraska. Sites are found on terraces of the Republican River and its tributaries.

Age: Raw radiocarbon dates range from before A.D. 1000 to the historic period--an impossibly long span; some are obviously in error. Recent analysis of these (Blakeslee 1975) suggest a more acceptable span of A.D. 1050 - 1350 for the phase as it is defined here (i.e. distinct from the Loup River Phase).

Major Sites: Major excavated sites are reported by Strong (1935) from the Lost Creek and Prairie Dog Creek localities, and by Kivett (1949) and Wedel (1934, 1935) for the Medicine Creek locality. Grange (1900) calls all Central Plains Tradition remains from the Red Willow locality, Upper Republican, but some of the sites may not belong in this phase.

Area: Sites of this phase are found in northwestern Kansas, eastern Colorado and south central to southwestern Nebraska (Grange 1980; Kivett 1949; Krause 1969; Wedel 1934, 1935, 1959, 1970; Wood 1969). The westernmost sites do not contain earthlodges or agricultural implements (Wood 1971).

Interpretive Statements: Wedel (1959); Wood (1969).

TABLE 9. SUMMARY OF THE LOWER LOUP FOCUS

Alternate names: Pawnee tribe

Economy: A dual economy of hunting and agriculture was practiced by the Pawnee. Only about a third of the year was spent in their permanent villages. The other two-thirds was spent on their biannual bison hunts. Corn, beans and squash were the traditional crops. According to Weltfish (1965: 119-123), they had seven to ten named varieties of each.

Settlement Pattern: The permanent villages were along major rivers in central Nebraska and North-central Kansas. Hunting camps are found in western Nebraska and presumably in western Kansas as well.

Houses: The earthlodges in the permanent villages were large (up to 60 feet), circular structures that housed one or more extended families. Bell-shaped storage pits were located inside and between houses. Some houses had a bison skull altar opposite the extended entryway. Skin tipis were used during the bison hunts.

Disposal of the dead: Cemeteries were situated on high ground at a distance from the village. The dead person was buried in a flexed or sitting position in a grave pit, over which a small mound was erected (Bushnell 1927: 79). Personal ornaments and possessions were sometimes placed with the dead.

Ceramics: Numerous ceramic types have been defined for the Lower Loup focus, within the Nance, Burkett, Wright, Colfax, Butler, Webster, and Walnut wares (Grange 1968). Pawnee pottery is generally elaborately decorated.

Stone tools: Manos, metates, anvil stones, end scrapers, projectile points, grooved mauls and axes, drills, shaft smoothers, and pipes are described by Wedel (1936: 74-80). Points are described as up to two inches long, with both notched and triangular forms present. Thick, heavy roughly elliptical scrapers and small, well-made end scrapers are present.

Bone, antler and shell tools: Scapula hoes and squash knives were common. Shell and bone beads, awls, picks, shaft straighteners, digging tools, and other tools are described by Wedel (1936: 81-89).

Trade and contact: The Pawnee had extensive trade contacts in all directions,. Ritualized trade partnerships involved the calumet ceremony.

TABLE 9. (cont.) SUMMARY OF THE LOWER LOUP FOCUS

Ancestry, subunits, and relationships: The Lower Loup focus is clearly identified with the Pawnee tribe (Grange 1969). Lower Loup appears to be descended from Middle Ceramic groups such as Upper Republican and Smoky Hill, but the full line of development has yet to be traced. The Pawnee tribe was divided first into two groups, the Skidi and the South Bands. The latter were the Chaui, Kitkehahki, and Pitehauerat.

Environment: Found in the major river valleys, the Sand Hills, Smoky Hills, and High Plains of Nebraska and northern Kansas.

Age: The exact beginning date for Lower Loup is moot. The earliest sites, such as Burkett, may date to the 1600's. The Pawnee abandoned Nebraska in the 1870's.

Major sites: In Kansas, two major sites have been investigated, the Kansas Monument Site in Republic County and the Bogan Site in Geary County.

Range: Villages in central Nebraska and north-central Kansas. Hunting territory extended at least to the western end of both states.

References: Hyde 1974; Weltfish 1965; Wedel 1936.

TABLE 10. SUMMARY OF THE GREAT BEND ASPECT

Alternate names: Wichita tribe, Quivirans.

Economy: Crops of corn, beans and squash were raised in permanent villages. Bison and other game was taken on extended hunting trips.

Settlement pattern: Large settlement complexes composed of multiple villages. Hunting camps have been reported from various parts of the state.

Houses: Grass houses from 10 to 20 or more feet in diameter are known. These had a central hearth. Large council circles near Lyons, Kansas, contain what may be charnel houses.

Disposal of the dead: The Wichita are supposed to have buried people on high bluffs near their villages. Very few have been properly investigated.

Ceramics: Geneseo Plain, Geneseo red filmed, and Geneseo simple stamped are amphora-shaped jars with loop or strap handles and high rims. Cowley ware is shell tempered but shares most shape attributes with the Geneseo types.

Stone tools: Side and end scrapers, Fresno, Scallorn, Reed and Washita projectile points are found. Unifacial blade tools are also common. Bifacial hafted and diamond-shaped knives are common.

Bone, antler, and shell tools: Scapula hoes, squash knives, digging stick tips, bone beamers and fleshers, awls and rasps are common. Shell beads and bone pendants are described by Bell (1984: 374).

Trade and contact: Southwestern pottery sherds, obsidian, and Southwestern style artifacts indicate fairly regular trade contacts.

Ancestry, subunits, and relationships: In the historic period, the Wichita were divided into numerous bands. The archeological remains in Kansas suggest the presence of at least three groups: in Rice County, near Marion, and near Arkansas City. The lithic sources used and the numbers of Southwestern trade artifacts indicate that each of these groups had its own territory. Ancestral groups may have included the Pratt and Bluff Creek complexes, but the connections are by no means definite.

Environment: The Arkansas River Lowlands and Flint Hills are where the villages are found. Hunting camps are scattered more

TABLE 10 (cont.) SUMMARY OF THE GREAT BEND ASPECT

widely.

Age: The Wichita were in their historic range in A.D. 1541, when they were visited by Coronado. Radiocarbon dates tend to be later than A.D. 1650. The Wichita had abandoned Kansas by A.D. 1720.

Major Sites: The three major site complexes are the Little River Focus on the Little Arkansas River and Cow Creek, the Lower Walnut Focus on the Arkansas and Walnut Rivers at their junction, and the unnamed focus near Marion on the Cottonwood River.

Range: The densest settlements are as listed above. Other Great Bend materials have been found near Neodesha, on the Arkansas River near Larned, on the Smoky Hill and Saline Rivers, on Bull Creek in Miami county, and near Fort Scott in Bourbon County.

References: Wedel 1941, 1959, 1967, 1977; Udden 1900; Bell et al 1974; Emerson 1976; Monger 1970; O'Brien 1984: 72; Blaine 1982.

TABLE 11. SUMMARY OF THE WHITE ROCK ASPECT

Alternate names: Oneota, Kansa tribe.

Economy: This complex appears to represent the westernmost villages and hunting camps of the Kansa tribe. These people lived by a mixed economy, both growing crops and hunting bison.

Settlement pattern: Kansa villages of up to more than 100 lodges are recorded in historic documents. The reported White Rock Aspect sites are all smaller than this, however.

Houses: Many types of houses have been described for the Kansa. They include circular earthlodges, long bark-covered lodges, grass houses and skin tipis.

Disposal of the dead: Individual burials with a covering of limestone slabs were located on bluffs near the camp or village. Morehouse (1903) reports that graves were common along the Kaw trail, and that the pony of the deceased was often killed on top of the grave. The body was left in either an extended or a semi-reclining position, with a few grave goods.

Ceramics: White Rock Aspect pottery appears to be a crude derivative of earlier and better made Oneota pottery. O'Brien (1984: 128) illustrates some White Rock Aspect pottery.

Stone tools: Small triangular Fresno type points are diagnostic of the period if not the cultural unit. Other tools, such as knives and scrapers, are common.

Bone, antler and shell: Scapula hoes have been reported.

Trade and contact: The Kansa are related linguistically to the Osage, but the relationship between these groups was often unfriendly. The Kansa traded with the Omaha, Osage, Pawnee and others.

Ancestry, subunits, and relationships: Neither the Kansa nor any of their Dhegiha-speaking relatives on the Plains can be traced back to prehistoric archeological complexes. They may have moved onto the Plains in the seventeenth century from the central Mississippi River valley and the Ohio River valley. If so, they probably are derived from one or more Middle Mississippian complexes.

Environment: The Kansa are known to have used the Osage Cuestas, Flint Hills, Smoky Hills and Arkansas River lowlands.

Age: From A.D. 1673 to A.D. 1873.

TABLE 11 (cont.) SUMMARY OF THE WHITE ROCK ASPECT

Major Sites: The White Rock Aspect is known from sites in Jewell and Mitchell Counties. Other Kansa sites in the state are the Doniphan site, 14DP2 (Wedel 1959), and the Blue River village near Manhattan (14PO24). Three other Kansa sites of the historic period have been reported south of Council Grove.

Range: At first contact, the Kansa were living in the extreme northeastern corner of the state, but they gradually moved west during the historic period. Their hunting territory extended at least as far southwest as the vicinity of Wichita and as far west as Jewell County. In 1867, they were camped in the vicinity of Dodge City.

References: Barry 1972; Morehouse 1903; O'Brien 1984; Unrau 1971; Wedel 1959.

TABLE 12. SUMMARY OF THE DISMAL RIVER ASPECT

Alternate names: Padouca, Plains Apache.

Economy: Nomadic hunting and gathering centered on bison and other game. Small gardens of corn, beans, squash and melons were grown as well.

Settlement pattern: Small sites on terraces bordering perennial streams, on the banks of sandhill lakes, and in caves and rockshelters (Wedel 1959: 590).

Houses: Circular structures about 25 feet in diameter have been reported. Some had a five post support system that may be related to the Navajo hogan.

Disposal of the dead: A few human remains have been found in baking pits, but little else is known of the disposal of the dead.

Ceramics: Tall jars with slightly constricted necks are found (Cassels 1983; Gunnerson 1960). These are seldom decorated. Some vessels have a micaceous paste similar to some Southwestern ceramics.

Stone tools: Small triangular and side-notched arrow points are found in Dismal River sites. Also present are end and side scrapers, drills, gravers, spokeshaves, sandstone shaft smoothers, and pigments.

Bone, antler and shell tools: Bone and antler projectile points, bison metapodial fleshers, awls, scapula hoes, ulna picks, needles, shaft wrenches, bone beads, and whistles are found (O'Brien 1984: 76).

Trade and contact: Euroamerican trade goods are found in these sites as are Southwestern sherds, obsidian and turquoise. Great Bend pottery has also been found (Wedel 1959: 594).

Ancestry, subunits, and relationships: Two foci, the Fort Scott in Kansas and the Stinking Water in Nebraska have been defined. Gunnerson (personal communication) has noted the tendency for Dismal River material culture from a particular site to look similar to the closest other cultural groups, whether Puebloan or Great Bend Aspect.

Environment: High Plains and Sandhills.

Age: Most sites appear to date around A.D. 1700. The Apache were in the region from before A.D. 1541, but the early sites have not been identified.

TABLE 12 (cont.) SUMMARY OF THE DISMAL RIVER ASPECT

Major sites: 14SC1 (El Cuartelejo or the Scott County Pueblo), 25HN37 and 25HO21.

Range: Western Nebraska, Kansas and Oklahoma, eastern Colorado, northeastern New Mexico.

References: Bowman 1969; Cassels 1983; Gunnerson 1960, 1968; O'Brien 1984; Rucker 1971; Schlesier 1972; Strong 1935; Wedel 1959, 1961; Williston and Martin 1899; Witty 1971a, 1971b.

DATES (B.P.)	PERIOD NAME	CULTURAL UNITS IN REGION	SITES AT WILSON LAKE
450	Late Ceramic	Great Bend Aspect Lower Loup Aspect Dismal River Aspect White Rock Aspect	14RU14, 14RU519 none none none
	Middle Ceramic	Upper Republican phase Smoky Hill phase	none 14LC301, 14RU14, 14RU302 14RU303, 14RU521
	Early Ceramic	Keith Focus unidentified Early Ceramic	14RU7, 14RU301, 14RU303 14RU311 (?), 14LC501 (?), 14RU525 (?), 14RU526 (?), 14RU527 (?), 14RU531 (?), 14RU532 (?)
2,000	Archaic	none yet documented	14LC501 (?)
7,500	PaleoIndian	Plano Tradition Folsom complex Llano horizon	none none none

TABLE 13. CULTURAL SEQUENCE AT WILSON LAKE

III.

CULTURAL OVERVIEW: HISTORY

The societies that used the Wilson Lake area in the historic period can be divided into four groups: nomadic tribes, village tribes, emigrant tribes and Euro-Americans. Each of these had its own particular adaptation to the local environment, as well as to a broader social environment. Each left an archeological record peculiar to its way of life.

The Plains Nomads

The nomadic tribes known to have been in and near the Wilson Lake Area include the Apache, Comanche, Kiowa, Kiowa-Apache, Cheyenne, and Arapaho. Other groups, such as the Sioux and Ute were only peripherally involved with the area and are not considered here.

Not all of these groups used the region around Wilson Lake at the same time, although there is some degree of temporal overlap. The Apaches were there at the beginning of the historic period but were displaced to the south and west by the Comanche. The Comanche were joined in the Southern Plains, at a time that is not clearly understood, by the Kiowa and Kiowa-Apache. All three were pushed south in turn by the Southern Cheyenne and Southern Arapaho who eventually entered into a grand alliance with them and fought against emigrant tribes and the encroaching Euro-Americans.

The Plains nomads are the only historic native groups that are likely to have lived in the Wilson Lake area for substantial periods of time. The Kiowa winter count, which is our best direct source of information about the adaptation of any of these groups, records an apparently random series of movements, with the midsummer Sun Dance held in one spot and winter camps set up elsewhere. The area covered by the Kiowa during the period recorded, A.D. 1833-1892, includes eastern Colorado, southwestern Kansas, western Oklahoma, and the panhandle of Texas. These are just the locations of camps of some duration; war parties and trading expeditions ranged south into Mexico, west to the Navajo and Ute country, north to the Crow territory in Wyoming and Montana, and east to the villages of settled tribes along the Arkansas River (Mooney 1979: 270, 271, 300, 320). Apparently, they camped in any single location only for a matter of months, although they might return several times over several decades to the same spot.

Plains Apache (ca. A.D. 1500-1725)

The Apache and Navajo of the American Southwest speak Athabascan dialects closely related to the languages of the Indians of western Canada. The linguistic similarity suggests a northern origin for these people some time in the last millennium (Hale and Harris 1979: 171-172). Archeological evidence indicates the arrival of some of these people in the Southwest just prior to A.D. 1500, but an early archeological record for most of the Apacheans is quite simply lacking.

Some Apache groups were living a nomadic life on the western Plains in 1541, when Coronado encountered a group that he called Querechos. The term apparently is derived from a Pecos word for Apaches (Opler 1983:387); thus the ethnic identity appears to be secure. Hence some Apaches were on the Plains at the very beginning of the historic period. How much earlier they may have arrived is an open question (Opler 1983:381-383).

Most Plains archeologists who have dealt with the question identify the Dismal River Aspect as the archeological remains of the Apaches who lived on the Plains around the beginning of the eighteenth century (Champe 1949; Gunnerson 1960; Wedel 1959:634-636). Missing are any well-identified Apachean sites prior to about A.D. 1650. Before to that time, they may have subsisted entirely by hunting and gathering and may not have manufactured pottery. This would make their archeological remains difficult to identify.

Some time prior to A.D. 1700, at least some of the Plains-dwelling Apaches took up horticulture on a small scale. When this happened, they left behind a distinctive archeological complex known now as the Dismal River Aspect. This adaptation was not long-lasting, however, as the Comanche began moving into the Southwestern Plains by A.D. 1705 and completely displaced the Apaches soon afterward, perhaps as early as 1739.

The only major scholar to question an Apache identity for the Dismal River Aspect is Morris Opler (1983). He prefers to interpret it as the remains of Puebloan refugees from the Southwest. Generally, he argues that Plains traits are weak among Apaches and that the Dismal River Aspect incorporates attributes that are missing among later Apache groups. Both facets of his argument, however, are themselves weak. Some of the Plains traits missing from Apachean culture, such as the Sun Dance and warrior societies, did not reach their full development until after the Apache had been driven from the Plains. Further, they tend to be weakly developed in peripheral Plains tribes such as the Comanche and Plains Cree. Finally, not all of the Dismal River attributes listed by Opler as missing from Apache culture were actually lacking

there in early times. Bone whistles are reported in use by an Apache group along the "Rio Colorado" in A.D. 1660. This calumet ceremony, a major cultural complex not reported among later Apaches, was also in use then. Thus Opler's argument falls short of the mark because he fails to consider the changes in both Plains cultures and the Apache way of life since the Apache left the Plains.

Apache bands known to have been on the Plains in the historic period include the ancestors of the modern Jicarilla and Lipan. Various names were applied to these groups in early times, in part because of general ignorance about them and in part because of their own fluid social organization. Terms applied to Apaches living or ranging out onto the Plains include: Querechos, Vaqueros, Sierra Blanca, Appaches de Cuartelejo, Palomas, Carlanas, Apaches Colorados, Apaches Conejeros, Chilpaines, Apaches de Trementina, Lemitas, Penxayes, Pelones, Padouca, Llaneros, Lipiyuans, and Calvos. The Navajo, who lived west of the mountains, also raided Plains tribes with some regularity (cf. Mooney 1979:320).

Whether Apache bands ever lived as far east in Kansas as the Wilson Lake area is uncertain. The only record that might relate to such an occupation, the Grand Village of the Padouca visited by Bourgmont, is discussed in the section on the Comanche. If what Bourgmont visited was really an Apache settlement, then it may have been one that was displaced eastward for a brief period by Comanche attacks or a temporary rendezvous for the purpose of treating with the French.

Comanche (A.D. 1705-1874)

The Comanche are a Shoshonean-speaking tribe who moved into the Southern Plains shortly after the beginning of the eighteenth century. They appear to have moved directly south along the eastern slope of the Rocky Mountains from an original homeland somewhere in western Wyoming on the Snake River country (Shimkin 1940:20). They are very closely related to the Shoshone of that region, and the "Snake" Indians of the early northern Plains may have included both Shoshone and Comanche.

When the Comanches arrived in the southern Plains, i.e., by A.D. 1705 (Thomas 1932:57), they already had acquired horses. They proceeded to raid New Mexico and Northern Mexico for more horses and mules, while they also raided other Plains Indian settlements for slaves to trade to the Spanish. Their raids completely dislodged the Plains Apache from Colorado, Nebraska, Kansas, and northern Texas.

After the Comanche became established in the southern Plains, the French usually referred to them as Padoucas, a term that may have indicated Apaches or other nomads at an earlier time (Wedel 1959:77-78). The identity of the Padouca is an ethnohistoric problem of long standing, but Wedel's

position seems most reasonable. It has application to this project because Etienne Veniard de Bourgmont visited a Padouca settlement somewhere near the Wilson Lake area in A.D. 1724.

Bourgmont used the term "Padauccas" in a document which has a date of 1717 but which probably refers to knowledge gained in an expedition made in 1714 (Giraud 1958: 5-6). He describes them as being allied with the Pawnee bands of the Platte River. At least some Apaches were at war with the Pawnee at this time; the Valverde expedition of 1719 received reports from Cuartelejo and Paloma Apaches of raids against them by Pawnee (Thomas 1935:132). This suggests that Bourgmont used the term to refer to Comanches. Champe (1949:291) uses another argument to draw the same conclusion. He notes that Bourgmont, in 1724, reports many horses among the Padouca, while the Apaches seen by Valverde in 1719 had few or none.

Wedel (1959:72-78), however, appears to favor an Apache identity for Bourgmont's Padouca. He points out that Bourgmont's description of them, including limited maize agriculture and some pottery, fits well with Spanish descriptions of the Apaches of the period and, tacitly, not with the Comanche. Rather, he dates the shift in the meaning of the term, Padouca, from Apache to Comanche, at roughly the middle of the eighteenth century (Wedel 1959:77-78).

In fact, some of Bourgmont's description fit neither Apache nor Comanche for that period. The "Grand Village" of the Padouca is described as having 500 lodges, 800 warriors, 1500 women and more than 2000 children. This is neither a typical Apache rancheria nor a typical Comanche band. Rather, it is likely to be an assembly of Padouca bands, whoever they might have been, expressly for the purpose of meeting and negotiating with Bourgmont and the Kansa he brought with him.

The exact position of the "Grand Village" has never been documented. Wedel (1959:31) critically reviews reconstructions which place it variously on the Saline River in Lincoln, Rice, Russell, Ellis, Trego, or Gove counties. Wedel himself prefers a location somewhere near present-day Lindsborg or Salina, based on distances and directions in Bourgmont's journal (Wedel 1959:30). He notes, however, as Connelley did before him, that such a location is surprisingly far east for a Padouca settlement.

At the times when the various reconstructions of the location of the Padouca village were made, the existence and location of well-marked Indian trails in Kansas were not known. It may be possible to use this information in conjunction with the Bourgmont journal, to pin down the location of the village more precisely. Unfortunately, the version of the journal published by Margry is not accurate (Mildred Wedel, personal communication). The original, located in the National Archives, must be consulted.

Kiowa and Kiowa Apache (? - 1874)

The origin of the Kiowa (and the Apache who affiliated with them) is one of the classic problems of Plains culture history. According to their own traditions, they migrated onto the Plains from the mountains near the headwaters of the Missouri River (Mooney 1979:152-168). Linguistically, however, there are indications of a southern origin. Kiowan is fairly closely related to the Tanoan languages of the American Southwest, a relationship that is recognized in the Kiowa-Tanoan family (Powell 1891). Phonetically, Kiowan is a typical Southern Plains language, whereas Apachean, for example, is not. Therefore, it is likely that the Kiowa were in or near the Southern Plains prior to a movement to the north (Kroeber 1939:80; Lowie 1953:1-4; Gunnerson 1984).

Whatever the earlier sequence may have been, the Kiowa appear to have been located on the headwaters of the Platte and Kansas Rivers when their historical as opposed to mythological traditions begin. Prior to a treaty with the Comanche that Mooney (1979:163-4) dates at about A.D. 1790, the Arkansas River was the boundary between the territories of the Comanche to the south and the Kiowa to the north. Thus, the Kiowa territory may have included the project area, although this is not certain. Regardless, the kind of archeological remains left by the Kiowa during this early period are not likely to be distinguishable from those of other nomadic groups.

After this treaty, the Kiowa moved south, and lived primarily south of the Arkansas River. The Kiowa winter counts, or annual calendars, provide information on locations and events in the period, A.D. 1833-1892). These show that the Kiowa were usually south of the project area, but they record some events that involve it directly or indirectly.

Cheyenne and Arapaho (ca. 1815-1875)

Both of the Algonkian-speaking groups are supposed to have entered the Plains in the historic period from the northeast (Jablow 1951). The primary documents regarding the Arapaho are extremely obscure, however, and the records of the movement of the Cheyenne are hardly less so. It is likely that neither group had coalesced into a tribe prior to entry onto the Plains, and at least some of the Cheyenne claim to have been on the Plains from early times, moving briefly eastward before returning early in the historic period (Clark n.d.).

Whatever the very early history may have been, the groups that were to become known as the Southern Cheyenne and

Southern Arapaho moved to the headwaters of the South Platte and Arkansas Rivers between A.D. 1810 and 1820. To do so, they apparently displaced the Comanche and Kiowa to the south. Later, however, the Southern Cheyenne and Arapaho allied themselves with the Kiowa and Comanche, at least episodically. The Long expedition of 1820 learned of rendezvous that united Cheyennes, Arapahoes, Kiowas, Comanches, Kiowa-Apaches, and a few Shoshonis (James 1966).

The territory claimed by the Cheyenne and Arapaho also overlapped the Pawnee hunting territory in western Kansas, and warfare with the Pawnee resulted. Some of the battles appear to have occurred near the project area. One history of Lincoln County describes the Cheyenne as making periodic sweeps against Pawnee raiding parties in the area between the Smoky Hill and Saline Rivers.

As with the Kiowa and Kiowa-Apache, the archeological remains of the Cheyenne in Kansas have not been studied properly. It is not likely that the remains of their camps, which should contain tipi rings, hearths, and trade goods, could be distinguished from those of contemporary nomadic tribes.

The Village Tribes

Three horticultural tribes may have used the Wilson Lake area during the historic period: the Wichita, Pawnee, and Kansa. All three created semi-permanent villages that they occupied in the spring and fall, leaving them for protracted hunts in the summer and winter. None are known to have had villages in the project area, but all three probably used it at one time or another on hunting, raiding, trading, and/or quarrying expeditions.

Short-term camps of all three groups could vary in size from quite small to very large (i.e., a whole band or village), and in duration from a single day to a period of weeks or more.

The Kansa (A.D. 1673-1873)

This Dhegiha-Siouan speaking tribe emerges into history on maps deriving from the Jolliet expedition of A.D. 1673, but no clear references to their location are available until 1718. At that time, they had a village at the mouth of Independence Creek, on the Missouri River in northeastern Kansas (Wedel 1959: Figure 4). At that time, however, their territory probably did not extend as far west as the Wilson Lake area, as their enemies, the Padouca, lay in that direction. In 1724, Bourgmont helped to make peace between the Kansa and Padouca at a Padouca "village" that may have been as far east as the vicinity of present Salina.

During the next century and a half, the Kansa first moved downstream on the Missouri River and then up the Kansas River to the region between Topeka and Manhattan. According to Wedel (1959: 52), various French maps place them in this position by 1796. A single written reference, by Trudeau in 1794, places the Kansa 80 leagues from the mouth of the Kansas River, well upriver from the map locations and west of Wilson Lake (Nasatir 1952 I:261). No likely Kansa village site has ever been reported from that far west, and this single report of a western location remains unverified.

From the village or villages along the midsection of the Kansas River, the tribe appears to have hunted to the south and west. The "Kaw Trail," which may have been far older than the Kansa occupation of Kansas, ran from several Kansa villages on the Kansas and Neosho Rivers southwest to the Great Bend of the Arkansas River. Another appears to have paralleled the Kansas River to Junction City, thence up the north side of the Smoky Hill River. This latter trail was followed by John Fremont, among others. It led directly toward the Wilson Lake area.

The archeological expression of the Kansa use of the Smoky Hill region is known as the Glen Elder Focus (Marshall 1967) and the White Rock Aspect (Rusco 1955). This is described in the section on the Late Ceramic period.

The Pawnee (A.D. 1541-1874)

The Pawnee were an alliance of Caddoan-speaking bands that occupied Nebraska and northern Kansas. Although there are four named bands within the Pawnee tribe, the main division is between the Skidi and the three others, known collectively as the South Bands. It is the South Bands whose territory included a significant portion of Kansas. The Republican band is known to have had at least one semi-permanent village in Kansas, and Tappage Pawnee villages are said by Dunbar (1880: 260) to have been located on the Smoky Hill River. Dunbar accompanied the Pawnee on a buffalo hunt in the Smoky Hill country, and the purported locations of former Tappage villages were pointed out to him there. No villages sites of the Lower Loup phase, which is the archeological expression of the protohistoric Pawnee, have yet been reported from this region, however. There is an 1785 reference to the Republican band living on the Kansas River at a spot about 130 leagues from its mouth. Wedel (1959: 59) prefers to interpret this as referring to a location on the Republican River rather than the Smoky Hill, and given the location of roughly contemporaneous villages there, he is probably correct.

The Republican band occupation of northern Kansas appears to have been disputed by the Kansa, and Lewis and Clark report that they rejoined the Grand band in Nebraska in 1803. Wedel (1959: 60) notes, however, that this may be in error since

Pike visited a Pawnee town on the Republican River in Nebraska in 1806. All reports indicate that the Pawnee bands repeatedly split up and coalesced during this period. Combined villages were ecologically unsound, but smaller units proved to be militarily indefensible.

How much earlier the Pawnee may have lived in Kansas than the first references to the Republican band in A.D. 1775 is an open question. The Arae or Harahey, who visited Coronado while he was in the Quiveran settlements in Rice and McPherson Counties, were certainly Pawnees. What we do not know is the number and location of the villages from which they came. It is possible that one or more were somewhere in northern Kansas, but there is no evidence for this. There also is no evidence for the supposed Tappage villages on the Smoky Hill. These could have been hunting camps, the evidence for which would be more ephemeral than for permanent villages. Or did the Tappage tell Dunbar about a much earlier occupation of the region, pointing to Smoky Hill phase sites that oral tradition said were occupied by their ancestors.

The Wichita (A.D. 1541-1720)

The Wichita bands, known collectively to the Spanish as Quiverans, were resident in Kansas when the Historic period began in A.D. 1541. A large series of their settlements, located in Rice and Ellsworth Counties, were visited by Coronado in that year. Two other roughly contemporaneous Wichita population centers were located near the mouth of the Walnut River in Cowley County and on the upper Cottonwood River in Marion County. Each of these groups appears to have controlled or utilized a different territory (Blakeslee 1984).

The Quiverans of Coronado, living on the upper reaches of the Little Arkansas River, are the ones most likely to have passed through the Wilson Lake area. The stone that they used for tools includes Smoky Hill jasper, a brown stone generally found north and west of Wilson Lake. The project area thus lies in a direct line between the villages and quarries these Indians appear to have used. If their pattern of acquiring stone was the same as that of the Pawnee studied by Holen (1983), they would have obtained it while en route to their bison hunting territory.

According to the careful interpretations that Mildred Wedel (1981) has made of various ethnohistorical records, the Wichita moved south from the northern reaches of Quivera between A.D. 1680 and 1720. They gradually moved southward, first to the Arkansas River in northern Oklahoma, then to the Red and Brazos Rivers. They returned briefly to Kansas, at the present site of the City of Wichita, during the Civil War. They returned to Oklahoma in 1867. There is no evidence that they ranged as far northwest as the Wilson Lake vicinity during their Civil War stay in Kansas.

The Emigrant Tribes (A.D. 1825-1873)

The territory that was to become the State of Kansas saw two very different Indian policies in the middle half of the nineteenth century. The first, dating from 1825 to 1843, was to establish a series of reservations in the Kansas territory for Indian tribes from the eastern United States. This policy had a dual goal: to open up formerly Indian-controlled land east of the Mississippi to homesteading and to protect the Indians from the deleterious effects of direct contact with frontier American life. To these ends, treaties were made with the Kansa and Osage tribes, restricting them to reservations that were small in comparison to the territories they formerly occupied or controlled. Into the land thus freed up came the Sac and Foxes, Kickapoos, Delawares, Potawatomies, Wyandots, Shawnees, Ioways, Ottawas, Peorias and Kaskaskias, Piankeshaws and Weas, and Cherokees. These people were promised that this removal would be the final one.

The second policy, dating from 1854 to 1871, was to remove them once again, this time to the Indian territory in what was to become Oklahoma. The nefarious means by which this was accomplished are discussed by Unrau and Miner (1978). Although their residence in the state was brief and the reservations restricted to the eastern third of the state, the presence of the emigrant tribes had an effect on the project area.

The emigrant tribes had long been in fairly intimate contact with the Euro-American frontier and were fairly well equipped with guns and other trade goods when they entered Kansas. They were also far more numerous than the Kansa and Osage who, indeed, remained in eastern Kansas. One result was that game became scarce and hunting expeditions west to the buffalo territory were mounted.

Another result was conflict between the emigrant tribes and those who considered the buffalo grounds their own hunting territory. Little scholarship has been directed towards the ensuing intertribal wars, but there are scattered references to repeated conflicts that occurred in the general vicinity of Wilson Lake. These were in addition to intertribal conflicts between the older residents of the general region, such as the Oto, Pawnee, Cheyenne, Kiowa, and Comanche. Of these tribes, all but the Oto can be documented in or near the project area.

In the summer of 1810, Bell's detachment from Stephen Long's expedition descended the Arkansas River along a portion of what was to become the Santa Fe trail. On July 30, they encountered an Arapaho war party that included a single Kiowa. On the next day, it was a Cheyenne war party returning from a raid against the Pawnee. Then on August 11, in western Rice County, they came across a third war party. This one was composed of Comanches who had started out to raid the Osage but who had been beaten badly by a smaller and better armed

Oto group (James 1966 II: 197, 207-211). It is likely that the Cheyenne party had come down the trail that passes through the Wilson Lake area; the others were encountered on the east-west route along the Arkansas River.

Numerous conflicts are recorded in the Kiowa winter counts. In 1836, the Kiowa were attacked by Comanches while in a camp somewhere north of the Arkansas River (Mooney 1898: 271). In 1841, a Pawnee war party that may have come down the trail was slaughtered by the Arapaho on the upper South Canadian River (ibid: 276). In 1847, another party of Pawnees was encountered, this time by the Kiowa, on the north fork of the Red River (ibid: 286). Again in the winter of 1849-50, the Kiowa battled a Pawnee war party, along the Salt Fork of the Arkansas River.

In 1851, in the summer, the same tribes fought again, as the Kiowa travelled north from the junction of Wolf Creek with the North Canadian River (the site of Fort Supply) past the head of Medicine Lodge Creek in Kansas. The route apparently crossed the Cimarron, up Satanta Creek, past the head of the Medicine Lodge and down Rattlesnake Creek and north across open country to the mouth of Walnut Creek and the southern end of the Pawnee Trail. Once again the latter is the route the Pawnee war party is most likely to have taken to reach their enemies.

The next year, there was a grand expedition of southern tribes against the Pawnees. The Kiowa and Kiowa-Apache were camped on the "Black Hill river", which was described to Mooney as lying between the Smoky Hill River and another called the "Cannonball River." The latter was so named for the large number of iron concretions in its vicinity--and was described as another branch of the Kansas River, apparently to the north of the Smoky Hill River. Mooney guessed that it might be the Solomon or the Republican River. If it was the Solomon, then the "Black Hill river" would have to be the Saline. On the other hand, if the "Cannonball" was the Republican River, then the "Black Hill" could have been either the Saline or the Solomon. In either case, the Kiowa were on or had crossed the Saline River that summer (Mooney 1979: 294-295, 407, 413).

At that camp, the Kiowa and Kiowa-Apache were invited to join the Cheyenne, Arapaho, and some Dakota against the Pawnee. Mooney (1979: 295) reports that about half of the warriors joined the expedition. The large force, which included men, women, and tipis, met the Pawnee somewhere in Kansas or Nebraska. The place appears to be on or beyond the "Cannonball River," where Mooney says the allies made their war medicine (Mooney 1979: 294). The Annual Report of the Commissioner of Indian Affairs for 1852 had the allies consisting of the Osage, Kiowa, and Kansa and omits mention of other groups. Since the Kiowa remember the event by the death of a Cheyenne chief, this may be in error (cf. Mooney 1979:

295).

In 1854, another combined expedition of southern tribes met defeat. This time it was at the hands of a small party of Sauk and Fox and Potawatomi. The allies included hundreds of Kiowa, Kiowa-Apache, Comanche, Cheyenne, Arapaho, Osage, and Crow. The Kiowa set out northward from Medicine Lodge Creek, crossing the Arkansas River and the Smoky Hill. Mooney (1979: 297) describes the battle as occurring on either the Smoky Hill or the Saline River, between Fort Harker and Fort Hays.

The Sac and Fox and Potawatomi party they met numbered only about 80 to 100 men, but they were well armed with rifles. Taking cover in a depression, they picked off some 16 to 20 of the allies, including 12 Kiowa. The Report of the Commissioner for Indian Affairs, No. 83, quoted by Mooney, makes it clear that the intent of the grand expedition was to push the emigrant tribes off from the plains. The superior arms of the enemy, however, proved decisive, and the Sac and Fox were said to have lost only six men, all to guns carried by the Osage.

This fight was followed by retaliations on both sides. A lone Sac warrior avenged the death of his brother in the battle by going alone to an Osage camp and taking a scalp (Commissioner of Indian Affairs 1854:312). In 1857, the Comanche tried for revenge against the Sauk and Fox, engaging them somewhere northeast of the previous battlefield. This time they were successful, and several Sauks were killed.

Intertribal warfare recorded in the Kiowa winter counts continued into the 1860's, with significant events recorded in the winters of 1854-55, 1855-56, 1857-58, and the summers of 1860, 1861, and 1868. In the 1860's, even more tribes became involved, as southern groups such as the Caddo, Wichita, Tonkawa, and Penateka Comanche fought the Kiowa "in Kansas, somewhere northward from Smoky-hill river" (Mooney 1979: 308). The Kiowa thought that the expedition was led by white soldiers, but lack of any official report of the battle makes this unlikely. It may have been an informal punitive expedition from Texas against the northern Comanche and Kiowa, who continually raided in that direction. Apparently, the battle site was not far north of the Smoky Hill, as the southerners pursued the Kiowa, Kwahadi Comanche, Cheyenne, and Arapaho north from an Arkansas River crossing (at the Great Bend?) for several days. At least one white, a Comanche, and a Kiowa were killed. A retaliatory raid against the Caddo occurred in 1860-61 (Mooney 1979: 308-309).

Several other sources refer to inter-tribal battles in the vicinity of Wilson Lake. One is a previously unpublished sketch map by J. R. Mead now in the manuscript division of the Kansas State Historical Society (Figure 2). It shows an "Otoe battlefield" adjacent to the trail in what is now Lincoln County. No explanation of the battle is included,

however, and there is no indication of who it was who fought the Oto there. Another fight, between the Pawnee and Potawatomie, is more fully described in other sources.

Eventually, the intertribal fighting died down as most of the nomadic tribes in the region joined forces against the intruding whites. Beginning in 1864, the Kiowa winter counts record nearly continuous fighting against soldiers. Forced onto a reservation in Oklahoma, they eventually made peace with their old enemies, the Pawnee, in the winter of 1872-73. This brought the intertribal warfare to an end, and the Pawnee themselves moved to Oklahoma shortly thereafter.

Euro-Americans

The '59ers

In 1858, gold was found on the South Platte River by W. Green Russell. Taken to Westport for assay, it set off a gold rush a decade after the California rush of 1849. People swarmed toward Colorado by various routes: down the Santa Fe trail to the mountains and then north along the foothills, along the Oregon trail to St. Vrain's post and then south, and along the Smoky Hill River and across the divide to the South Platte.

Travel up the Smoky Hill route was both arduous and dangerous. The Blue brothers party was reduced to cannibalism during a winter crossing, and the lone survivor owed his life to the kindness of the Arapahoes. As a result, the Smoky Hill route came to be known as the Starvation Trail (Lee and Raynesford 1980: 39-50).

Various towns in Kansas competed for the business brought by the '59ers. They did so by touting the advantages of the routes that ran near them in newspapers and pamphlets. The Lawrence Republican, Wyandotte Commerical Gazette, and Junction Freedom's Champion, a pamphlet published in Atchison, provided a complete guide to each step of the journey from Atchison to Denver. It advocated going 284 miles up the Smoky Hill to the Pawnee trail. Travellers were then advised to follow the trail 35 miles from there to the Pawnee Fork, then up the Arkansas River to the Rockies (Lee and Raynesford 1980: 34-36).

The flood of people moving west was viewed as an economic resource by many people. Among them were William Russell, Alexander Majors, and William Waddell who established the Leavenworth and Pike's Peak Express (Lee and Raynesford 1980: 19-38). A route for this freight and stage line was scouted out beginning on March 15, stations were set up, and the first wagon train left Leavenworth on March 28. The first stagecoach

MEAD MAP OF THE PAWNEE TRAIL. COURTESY OF THE KANSAS STATE HISTORICAL SOCIETY

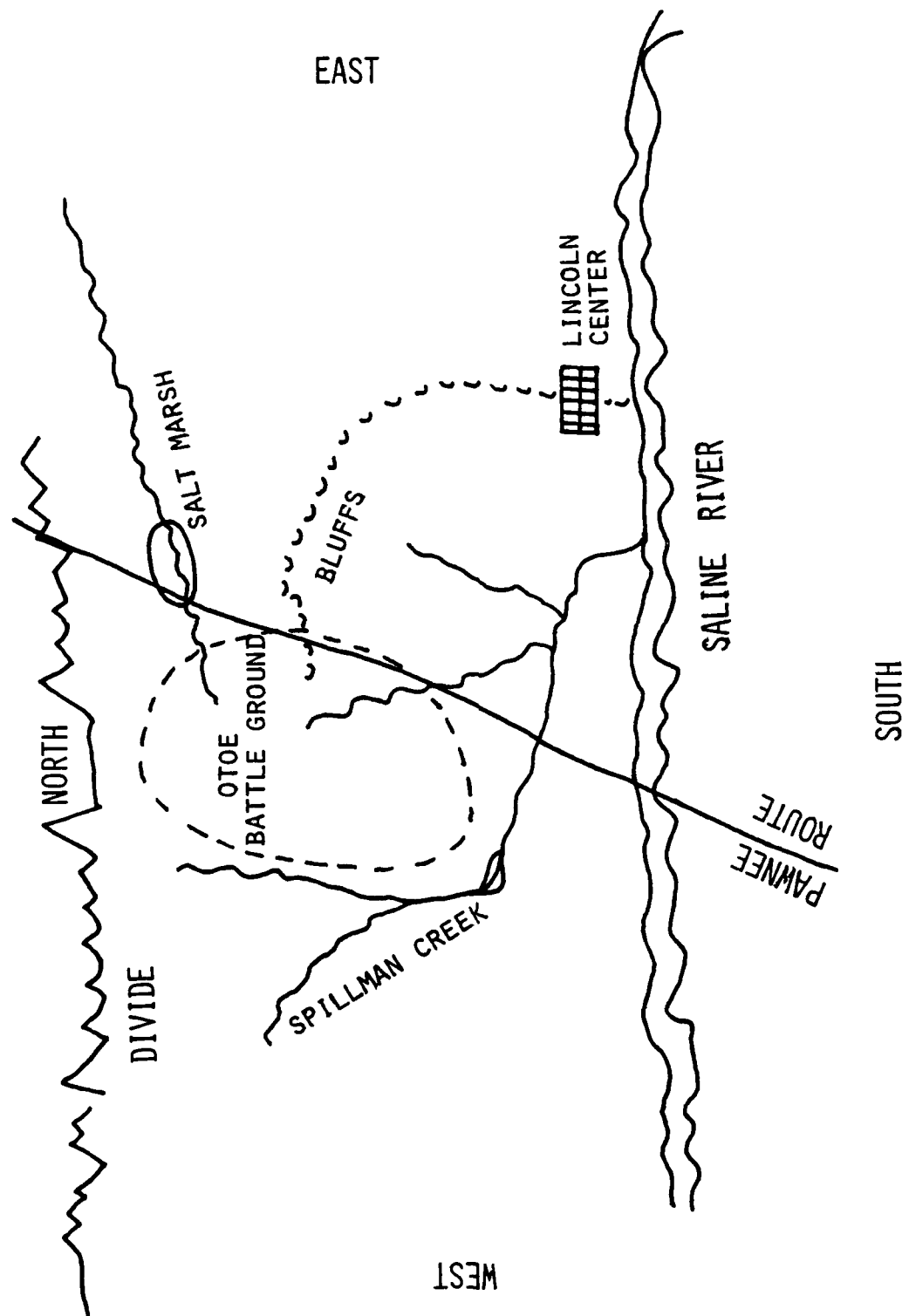


FIGURE 2

left two weeks later. The route led up the north side of the Kansas River from near Topeka to Junction City, across the Republican River at its mouth and up the divide between the Republican and the Solomon Rivers. This led away from the Wilson Lake area, and the route was soon changed to the Platte River valley, leaving the central Kansas route open to new developments.

The Butterfield Trail

In 1864, David Butterfield moved into the vacuum left by the L&PPE (Lee and Raynesford 1980: 51-92). With backing from eastern financiers, he had the Smoky Hill route resurveyed in 1860. Lieutenant Julian R. Fitch, escorted by two companies of cavalry, accomplished the task with dispatch. He set up 40 stations between Fort Riley and Denver along a route 592 miles long.

The route led past the south side of Wilson Lake, south of the present route of I-70. Four miles west and one mile south of the present-day town of Wilson was

...a station first called Lost Creek, then Wilson Creek, and later Hick's station. This was a home station, where passengers could disembark and get a meal. The trail now turned almost due west, keeping to the level benchland north of the twisting Smoky Hill River.

Lee and Raynesford 1980: 60

This well-organized stage line had a brief but exciting history. It went into an abrupt decline after 1870, when the Kansas Pacific Railroad reached Denver. In the decade of its use, it provided an expensive (\$175, meals extra) and uncomfortable ride to and from Denver (Lee and Raynesford 1980: 59).

The Hunters

The first people of European descent to occupy the Wilson Lake region were hunters. The most prominent of these was J. R. Mead who later helped to found the city of Wichita. In 1859, he created a "hunting ranch" consisting of a log cabin and corral near the eastern end of Lincoln County, on the north bank of the Saline River (Homan 1979: 7; Barr 1908: 15-16). From that spot, he conducted numerous hunting expeditions to the west, including some of what is now Wilson Lake in the early 1860's.

Other hunters active during the same period were Mike Sterns, Tom Boyle, Ade Spahn, and a man named Dean. They may have preceded Mead into the area, as Barr (1908: 15-16) has them active in 1858 and 1859. Their headquarters was near the

mouth of Beaver Creek in eastern Lincoln County.

The pattern of settling in the eastern part of what became Lincoln County continued well into the period of immigration of settlers. The western part of Lincoln County and eastern Russell County were too dangerous because of the existence of the Pawnee trail there. The Indian raids, when they came, were from the west and affected the westernmost settlements most severely.

The names of three other people active in this early period have been recorded. One was Alexander Spillman, who had preceded J. R. Mead and who described the area to him. In 1859, Spillman had settled at Salina, where Mead met him. Mead later named Spillman Creek after him, having recognized it from Spillman's description (Homan 1979: 7). The other people who entered the Wilson Lake area were named Walker and Newhouse. In 1860, they became lost in the Hell Creek Canyon and named the place for their misadventure (Homan 1979: 8).

Other hunters in the Wilson Lake region continued their activities into the 1870's and the extinction of the buffalo herds. Hunters supplied the military units in the area and both the Butterfield Express stations and the railway workers. In the short interval between the end of railroad construction, the emphasis was on hunting for hides rather than for meat. A few first-hand accounts of these hunts have been preserved (Linville 1974: 85-86). The bison bones left by the hunters provided an income to early settlers, who would gather them and take them to railroad stations. From there, they were taken east to be processed for fertilizer (Barr 1908: 23).

The Railroad

The Union and Kansas Pacific Railroad was constructed across Kansas in the period between 1863 and 1869. The extension to Denver was completed in 1870 (Crippen 1981). Originally, the route planned was along the Kansas River, then up the Republican into Nebraska. When it became evident that the Kansas line would not reach the 100th meridian before that being built through Nebraska, the route was changed to one up the Smoky Hill valley, with the goal of connecting to Denver (Anderson 1963: 11-13).

Obstacles to the completion of the task were numerous. In addition to natural hazards, disease, and Indian hostility, they included internal disagreements within the company (Lee and Raynesford 1980: 149-151). These led to the murder of Samuel Hallett, the driving force behind the westward thrust across Kansas.

Natural hazards included blizzards and floods. Both struck in 1867 (Lee and Raynesford 1980: 155-156). Low bridges across streams were frequently washed away, and grades

were undermined by high water. Nonetheless, the rails were pushed to the west, with the section near Wilson Lake laid out in the summer of 1867.

It was as the tracks were laid west of Ellsworth that the Indians responded to the threat to their hunting grounds. The attacks began in May of 1867 and intensified thereafter. One skirmish, discussed below, occurred at the Wilson station. The Indians failed to stop construction at this point, however, and most of the fighting occurred west of Wilson.

The route of the Kansas Pacific line paralleled that of the Butterfield Trail through this region. The line of towns south of Wilson Lake--Wilson, Dorrance, Banker Hill, and Russell--grew up around stations along the track. The Wilson station was named for the nearby Wilson's Creek station of the Butterfield Trail.

By 1868, the line had reached Sheridan, west of Monument Rock. Here construction was halted until permission was given to complete the line to Denver (Anderson 1963: 15). As the rail line moved westward, the section covered by stagecoaches to Denver narrowed until nothing was left.

Traffic on the line varied through time. According to Anderson (1963: 30), the first year's traffic consisted almost entirely of whiskey, gambling equipment, and passenger coaches full of gamblers. Thereafter, cattle became the most important traffic.

The great cattle trails and towns associated with this railroad were east of the Wilson Lake area. Abilene and then Ellsworth were the cattle towns (Crippen 1981: 39-42). Settlement of the land by farmers forced the shift to the west, so that the Abilene cattle trade, which began in 1867, was already in decline in the early 1870's.

Ellsworth then took over as the major cattle town (Lee and Raynesford 1980: 201-212). The trade there began in 1872 and lasted only until 1873, when Wichita captured the trade. Texas cattle continued to be moved across the Smoky Hill River, but the trails were now west of the Wilson Lake area. The cattle were destined for Ogulalla, Nebraska, and the grasslands of Wyoming, Montana, and the Dakotas (Lee and Raynesford 1980: 214). With this shift, the cattle drive trade of western Kansas ended.

The Indian Wars

East of Wilson Lake, Indian raids began in 1864 with the destruction of the little settlement in Lincoln County created by the Moffit brothers (Homan 1979: 12-13). These were minor in comparison to the troubles that occurred in 1868 and 1869. The Indian raids in 1868 are well documented (Barr 1908: 30-39; Bernhardt 1910; Homan 1979: 20-50). The raiders came down

the Saline River from the west and devastated the westernmost settlements, then in Lincoln County. The recently established Danish community was especially hard hit (Homan 1979: 41-50). Settlers were killed, and two women were taken captive. A rescue expedition from Fort Zarah was led by Col. Benteen of the 7th Cavalry (Homan 1979: 25).

Part of the military response was the creation of blockhouses, including one in Lincoln County (Homan 1979: 23). A company of scouts was recruited from among the settlers, and these men were later involved in the battle of Beecher's Island (Homan 1979: 26-37). Raids by Indians against the settlers of the area ended in 1869. The settlers massacred a party of 16 Pawnees in the same year (Barr 1908: 36-37; Homan 1979: 40-41). Thereafter, Indian troubles were limited to the occasional stolen horse.

Just a short distance west of the Wilson Lake area, the fighting continued practically unabated during the whole period between 1865 and 1869. In this unsettled region, the attacks were directed first against the stations along the Butterfield Trail and later against the Kansas Pacific Railroad crews. The attacks increased in intensity until 1868, when in western Kansas, the toll included 157 killed, 4 women and 24 children taken captive, 1600 horses lost, 24 ranches and farms destroyed, 11 stagecoaches and 4 wagon trains destroyed (Lee and Raynesford 1980: 74-133). The fighting eased off in 1870, as the flood of settlers combined with sharp defeats in 1869 overwhelmed the Indian defense of their buffalo hunting territory.

At Wilson Lake itself, there was only one minor skirmish. On June 27, 1867, the men working on the Union and Kansas Pacific Railroad were attacked by unidentified Indians. During the whole period, however, the main opposition to the westward expansion in this area came from the Cheyenne and Sioux, who were working in close cooperation. The Kiowa and Comanche were also active, but usually further to the south. It is likely therefore, that the attackers were Cheyenne and/or Sioux. They suffered several men dead in the encounter at Wilson Station, while the railroad workers lost one man with another badly wounded (Snell and Richmond 1966: 340).

The Settlers

Settlement of the area by farmers and ranchers began in 1866, at the eastern end of Lincoln County. A previous settlement there in 1864, by a small group led by the Moffit brothers, was terminated by an Indian raid in that year (Barr 1908: 18-19; Homan 1979: 9). J. R. Mead had left before this, warned by some Indian friends that trouble was imminent (Ignace Jones, personal communication).

In late 1865 and early 1866, the first permanent

settlement was made by the "Colorado boys." These were men who had served in the First Colorado Infantry, doing service guarding mail coaches through the region (Barr 1908: 21-22; Homan 1979: 13-14).

Immigration continued in Lincoln County during the 1860's and in Russell County into the 1870's. Various ethnic groups were represented, including Danes (Homan 1979: 41), Germans and Czechs (Muilenburg and Swineford 1980: 16-20). The town of Wilson, originally called Bosland, was founded by Francis Swelha in 1874. Swelha was active in attracting other (Bohemian) Czechs to the area, and the Wilson Lake area was dominated by this ethnic group.

The name of the town of Wilson has a long and involved history. It starts with the naming of Hell Creek for the incident when two men became lost there. A station on the Butterfield Overland Dispatch route was named for this spot, but in the socially acceptable form of Lost Creek. The Lost Creek Station, which was located several miles west of the present town of Wilson, was later renamed Wilson's Station, apparently for a stationmaster who worked there. When the railroad was built in 1867, a depot was established in the town of Bosland, but the term for the old stagecoach station came to be applied to the railroad station in Bosland. Eventually, the name, Wilson, came to be used as the common and then the official name for the town as well.

Settlement was strongly influenced by the natural environment at first. The first homesteaders all chose property along the main streams where what little timber existed was available. The General Land Office survey mapped the westernmost structure in the region at the Twin Grove, a few miles downstream from today's Wilson Lake dam. Later, when the railroad lines were emplaced, towns sprang up at intervals along them.

From the beginning of settlement in this region, both small farms and large ranches co-existed. Severe competition between homesteaders and ranchers and between cattlemen and sheepmen never developed here as they did elsewhere. Cattle-raising began as early as 1864 (Homan 1979:11), and livestock-raising has remained important to the present day on the uplands of the region. The Wilson Lake area was north of the railroad line and so remained outside of the main cattle drive area which included towns like Atchison and Ellsworth.

The largest scale attempt at ranching was that of George Grant in Ellis County. In 1873, he purchased 70,000 acres of land from the Kansas Pacific Railroad and established the town site of Victoria. In his scheme, it was to be populated by the younger sons of aristocratic British and Scottish families. Some of these remittance men actually came to Kansas, and Grant imported the first black Angus cattle to the area, but the colony failed after his death in 1878

(Muilenberg and Swineford 1980: 21).

At Wilson Lake proper, major ranches included the Cooper Gilt Edge Ranch, remains of which were located during the survey, C. A. Shaffer's ranch in the spot that is now Wilson State Park, and Gifford and Eaton's Sheep Ranch on Cedar Creek. Waldbridge (1966) provides an account of life on a sheep ranch near Russell. Farm life in the region has also been documented (Donaldson 1971).

The cattle industry in the Wilson Lake area has been featured in a book, and a movie based on the book has been filmed but not released. Robert Day's (1977) "The Last Cattle Drive" centers on a fictional modern-day drive from the "Tukle Ranch" north of Hays to Kansas City. The drive is not related even fictionally to the historic drives from Texas north to the railheads, but instead is a response by one of the principal characters in the novel to what he considers to be outrageous trucking costs.

He therefore decides to drive his cattle to Kansas City himself, using section line roads for his cattle trail. The route takes him through the Wilson Lake area, with stops at Lucas and Wilson. Local features, particularly the Graden of Eden in Lucas are featured.

Not all of the details are accurate, however. At one point, the road across Wilson Lake Dam is called a bridge (Day 1977: 116) and the route from Lucas to the dam is described as coming "out of the hills to the east of Wilson Lake," rather than from the northwest. From the dam, they travelled south along the road (Highway 232) past "the southern boundary road of the lake" to an intersection where an accident occurred. A mobile home coming along a road from the left ran into the herd, injuring five steers. The road to which the author obviously intended to refer comes from the right (west), from a camping area on the lakeshore.

Finally, after passing Wilson, the modern day drovers return to Wilson to the "motel" for dinner and to spend the night. Local residents were probably miffed by this error; there is a fine old hotel in Wilson with a well-known restaurant of which local people are proud. Wilson does not presently contain a motel, though there was previously one at the I-70 intersection.

Other than these minor errors, the novel is an accurate depiction of ranch and small town life in the Saline valley. Like the narrator of the novel, our crew sometimes spent time watching the cold fronts come in (Day 1977: 49).

IV.

RESEARCH DESIGN

Previous Work Done in the Study Area

Initial Assessments 1948-1957

The preliminary archeological report for Wilson Reservoir was submitted in March, 1948, by Wesley L. Bliss and Waldo R. Wedel for the Missouri River Basin Survey. The purpose of the study was to locate and record any archeological remains likely to be damaged or destroyed by the construction of the reservoir. Field work was done by Bliss and J. Joseph Bauxar. Six sites, which included petroglyphs and occupation sites, were located in a two-day survey. All of the residents in the area were interviewed to find information on the sites and a total of 150 black and white, and 15 Kodachrome photographs were taken.

Following the recommendation of that survey, an additional survey was done in September and October, 1952 by Ralph S. Solecki and J. M. Shippee. This was submitted in December 1952 by the Missouri Basin Project. During this survey, an additional 12 sites were located and recorded. A total of 267 artifacts including 231 potsherds, and 34 chipped stone artifacts were recovered. These sites included occupation sites, mounds ('probable burials'), rock shelters, caves, and petroglyphs. Two of the sites recorded earlier were also revisited.

A survey of petroglyphs in the central Kansas region was conducted intermittently by the University of Kansas Museum of Anthropology between 1955 and 1957. One petroglyph site in the Wilson Lake area was described (Horr and Johnson 1957). This was identified as the burnt city site and is possibly the site designed 14RU12.

Salvage Archeology, 1960-1962

In July and August, 1960, a field crew from the Kansas State Historical Society led by Thomas A. Witty, Jr. (1962), performed additional archeological investigations in the project area. The purpose was to salvage archeological data which would be destroyed or inundated by construction of the reservoir. Two of the sites located in earlier excavations were selected for excavation. These included an earthlodge and a rock shelter. A total of eight weeks was spent in the field, and during the work an additional five sites were located and recorded in the immediate vicinity. Two of these were partially excavated, one was tested and a petroglyph site was

photographed. All work was confined to the southeast corner of the reservoir in the Hell Creek area. The earthlodge site, which was originally designated 14RU18, and the rock shelter which was originally designated as 14RU17, were redesignated 14LC301 and 14LC302, respectively, since they were originally listed for the wrong county.

Preliminary Management Plan, 1978

In 1978, a cultural resource plan, using the previous studies for Wilson Lake, was written by C. A. Ungar. That report emphasized the need for additional archeological studies in the form of intensive studies and some form of site preservation activities (Ungar 1978: 33).

In 1979, the Historic Preservation Department of the Kansas State Historical Society performed an intensive inventory of petroglyphs in the State of Kansas. This survey included additional information on the sites previously recorded for Wilson Reservoir.

Surveys of Public Use Areas, 1979

In October, 1979, Don Rowlison of the Kansas State Historical Society conducted a survey in four public use areas on Wilson Reservoir (Rowlison and Witty, 1982). These areas were Lucas, Minooka, Otoe, and Sylvan Parks. Three additional sites were recorded. One of these was an historic site and one was a paleontological site. The only prehistoric site was a mound, 14RU311.

In 1981, William Brogan of the Kansas State Historical Society conducted an archeological survey in advance of a secondary road project in Russell County. During this research, he located an additional site, 14RU318, near the extreme upper end of the survey area for this project. This was the last archeological work reported for the project area.

National Register

More recently, one site at Wilson Lake was placed on the National Register of Historic Places. This is 14RU10, a petroglyph site in a rockshelter. The nomination to the National Register was made by the Kansas State Historical Society as part of a thematic nomination involving petroglyph sites. The site, according to the records, lies in the survey area.

AREAS SURVEYED AT WILSON LAKE

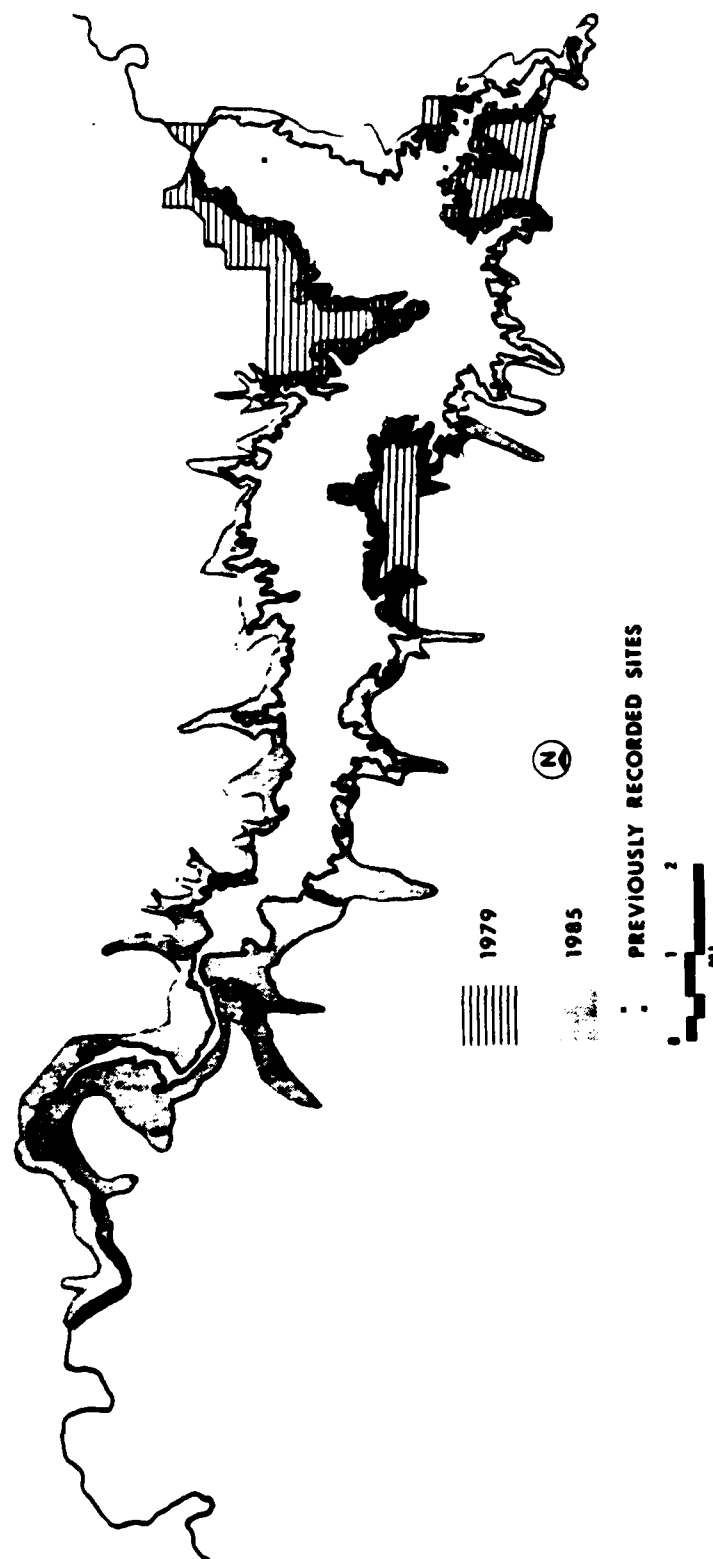


Figure 3

At times, the realities of field archeology can make the careful creation of a research design seem like an exercise in futility. To a certain extent, this was the case at Wilson Lake. Six primary research goals were proposed for the survey. These took into account the potentials and limitations of this kind of survey. Shoreline surveys impose strong constraints on the sorts of serious archeological research that can be done. This is so because the ribbon of land in the project area, between the lake and the elevation that determines the outer boundary is a non-random sample of the total landscape. Therefore, the set of archeological materials found in it may not be representative in terms of number, age, and function, of the total set of sites in the locality. Furthermore, the presence of the lake obscures half of the area of each shoreline site. These constraints mean that neither macro-level (inter-site) settlement pattern studies nor site catchment analyses are going to be productive.

The fact that most of the sites are represented primarily by surface collections also puts constraints on the research that can be done. The most common materials in the prehistoric sites are lithics, ceramics, and bone, and to succeed, any research design must emphasize these. For the historic period, documentary sources are also available, and the research design took these into account.

Site Location, Type and Function

The primary goal of this type of survey is simply to find sites. In the case of a shoreline survey, some sites in the survey zone are threatened by erosion. We therefore kept a record of the state of the shoreline as we surveyed. Three states were recorded: eroding, stable, and active deposition. Obviously, sites that occur in areas where the shoreline is eroding are most threatened. There is no threat from erosion where the shoreline is stable, while in areas of deposition, sites may be obscured, but they are not apt to be harmed. The information about the shoreline was recorded on topographic maps and these maps were provided to the Corps of Engineers for management use.

It is also appropriate in this type of survey to attempt to determine site type and site function(s). There is no guarantee, however, that the necessary types of information will be recovered by the sort of survey and testing specified in the contract. For some sites, it was impossible to specify site type from surface evidence. Sites found in the Wilson Lake area include habitation sites, campsites, rockshelters, petroglyphs, mounds, an historic cemetery, and a bridge. Most of these categories are self-evident; prehistoric habitation sites are distinguished from campsites on the basis of density and diversity of material remains (indicative of duration of occupation) and evidence, such as daub for permanent structures.

Determining site function on the basis of the results of surface survey and limited testing is extremely difficult. The basic problem is inadequate sample size. Materials obtained from limited tests may give an erroneous impression of the full range of information present. Nonetheless, it was sometimes possible to identify site function or at least some site functions from limited collections. This was done by examining the tool assemblage and any special remains found, such as petroglyphs, burials and the like. The apparent function(s) of each site and the limitations of the evidence in this regard are included in the site summaries.

Cultural Landscapes

One remarkable aspect of the Wilson Lake area and one that proved to have considerable potential for significant research, is the presence of an important Indian trail through the region. The Pawnee trail ran from central Nebraska in a southwesterly direction into Kansas and on to the Great Bend of the Arkansas River. From there, it followed the course of the river west and eventually led to Santa Fe. The literature search dealing with this trail turned out to be a major component of this project. The results, however, are well worth the effort, as they demonstrate that this feature of the landscape was a major factor in the early history of Kansas.

The research orientation for the historic period focused primarily on the concept of cultural landscapes. The environment with which human societies interact is not the total natural environment but the environment as perceived and transformed by humans (Cohen 1974: 9-17). The Euro-American settlement of the Plains has led to profound changes in the environment, both as it is perceived and as it has been transformed. Some documentary sources were available to document both sorts of changes during the historic period. They include GLO notes and maps of 1866, county atlases, other early maps, aerial photographs, property ownership maps, and the like. Features of the cultural landscape that we hoped to study include springs, water holes, trails, roads, quarries, farm ponds, groves of trees, and farmsteads. We expected that a diachronic view of these features and the changing perceptions of them would allow placement of the Euro-American sites in a strong interpretive context.

As will be seen, however, the results of this effort were not as powerful as we had hoped. While there are some aspects of older Euro-American cultural landscapes still visible at Wilson Lake, others had been destroyed so completely at the time that the lake was constructed that they were no longer amenable to study. This was particularly true of the layout of the old ranches around the lake.

Culture History

Another research focus of the project was on reconstructing a local cultural sequence. As Willey and Phillips (1958: 25) note, local sequences "are the very stuff of archaeology"; they provide the basis upon which processual analyses depend. At Wilson Lake, where the expressions of the lengthy Archaic period were basically unknown, the need for a firmly-based local sequence was obvious.

Building a local sequence requires diagnosis of the cultural affiliation of archeological remains and careful chronology building. Determining the affiliation of Kansas ceramic and lithic assemblages requires only prior experience in the region and access to the appropriate literature and experts. Chronology building is a different matter. Most archeologists in the region depend primarily on radiocarbon dating and do not give the effort required to analyze the results properly (Blakeslee 1982, 1983).

We hoped to use radiocarbon and thermoluminescence (TL) in combination with archeomagnetism to provide more complete information. Thermoluminescence is a chronometric dating technique applicable to both pottery and heated stone. It works using free electrons that accumulate in crystalline and crypto-crystalline (e.g., chert) materials as a result of radiation damage. Heating a material that has accumulated a large number of the free electrons will cause it to radiate a measurable amount of light. The intensity of the light given off depends on the nature of the material, how much time has elapsed since it was last heated, and the intensity of the radiation to which it was exposed. The latter is determined from soil samples collected with the specimen to be dated, and the susceptibility of the material to radiation damage is determined in the laboratory, allowing calculation of the time elapsed since last heating (Michels 1973: 189-200).

Archeomagnetic dating uses baked soil from hearths to determine age. Heating iron-containing material such as soil allows the magnetic particles in it to align themselves with the earth's magnetic field. They remain in this alignment once the soil cools below a critical temperature called the Curie point. The earth's magnetic field slowly changes direction, in terms of both azimuth and dip. (Intensity changes as well). Old hearths thus record the direction of the field at the time they were last fired. If the history of the apparent motion of the earth's field is known for a region, then the age of a hearth can be calculated from the direction of the field frozen in it. In the case of the Central Plains, the history of the movements of the field is not yet known, but work on this problem has begun (Eighmy 1984).

Thus, archeomagnetic analyses, at the present time, do not yield dates, but every hearth encountered in the plains

should be sampled so that a master curve for the region can be developed. When such a curve is developed (the process was begun in the summer of 1984), the result will be an independent technique that has at least as much accuracy as radiocarbon.

We therefore kept an eye out for samples that could be dated by these techniques. None were forthcoming, primarily because of the paucity of buried cultural deposits around the lake shore. A single buried hearth was encountered, but because it was in a deposit of sand, it was not amenable to archeomagnetic analysis. Similarly, some pieces of heated chert were found, but only in plowzone deposits. Material that has been close to the surface, and especially material that is lying on the surface of the ground, cannot be used for TL dating because solar radiation can erase some of the radiation record and because it is too difficult to control for cosmic radiation.

Site Location Decisions

A third research focus was on site location decisions. Site location analysis is a part of settlement pattern analysis, but it is not identical to it. The focus is on why prehistoric people settled at some spots and not at others. This approach does not require as much information as macro-level settlement pattern or site catchment analysis and is amenable to shoreline survey data. The utility of such analysis is that it allows creation of site location models that are applicable to large regions. Work at Hillsdale Lake resulted in a site location model applicable to non-loess covered regions of alternating shale and limestone (Blakeslee and Rohn, in press). We hoped that such model(s) developed at Wilson Lake would be applicable to the extensive region of outcrop of Dakota sandstone in Kansas and Nebraska.

Site location decisions are made on the basis of the perceived landscape. Factors at Wilson Lake might include access to the uplands, nearness to spring and water holes in the streams, access to streams via point bars, accessibility to timber, permeability of soil and nearness to trails. Point bars are accumulations of sand and gravel on the inner side of stream meanders. Usually there is a gentle slope from the floodplains to the point bar and hence to the water in the stream at these points. The relationship between these items and the focus on historic cultural landscapes discussed above should be obvious.

Information pertinent to these decisions was compiled from documentary sources. General Land Office survey notes (1867) indicated the location of a few groves of trees and some springs in and near the project area. They also appear to indicate little in the way of stream meandering and change in where trees are found, indicating that modern conditions, with appropriate caution, may be applied to prehistoric sites.

We ended up being able to do little of this sort of analysis, however, as the number of sites found was not sufficient to demonstrate strong patterning. Indeed, the number of habitation sites was far too low for any analysis at all. There does seem to be, however, a connection between the Pawnee trail and the concentration of prehistoric sites at the lower end of the lake.

Ceramic and Lithic Provenance

The fourth focus proposed was on using ceramic and lithic provenance as a means of determining aspects of territoriality and exchange. Many of the chert sources in Kansas can be clearly separated using only macroscopic inspection of the artifacts. Western sources with which the authors are familiar includes Alibates agatized dolomite, various materials found in the Oglalla formation, Parker fossilized wood, Smoky Hill jasper, and flattop chalcedony. Eastern sources include Florence A, B, C, and D, Wreford A and B, Nehawka chert, Winterset chert, Westerville cherts. Most of these are readily distinguished from one another. Dr. James Gundersen agreed to provide X-ray diffraction and X-ray fluorescence analyses on a consultant basis for pipestones and obsidians.

The kinds of temper that are found in pottery can also provide some indication of the area in which they were made. This is particularly true in Kansas, where the materials available for temper vary considerably from region to region. Crushed granite, for instance, indicates a vessel that was made somewhere in the glaciated region of the northeastern part of the state, where granite drift cobbles are available. Used in combination with information about lithic provenance, we felt that temper analysis would provide valuable clues regarding territoriality or exchange.

As it turned out, this sort of analysis was possible only for one of the prehistoric sites at Wilson Lake. The problem was simply that sample sizes were far too small to determine much of anything, and the bulk of the prehistoric sites were petroglyphs and cairns that yielded no artifacts whatsoever.

Geomorphology

The fifth research focus was on the geomorphology of the sites found. Geomorphological analysis can provide important information regarding the ancient landscapes in which human occupations occurred, and like site location analysis, can provide the basis for predictive models applicable to a larger region.

In the case of Wilson Lake, the geological setting is an eastward flowing stream that has cut through and exposed the

Dakota sandstone and has deposited some overlying sediments. The lack of apparent lateral movement of the Saline River between 1867 (from GLO survey notes) and 1964 indicates that the stream is now entrenched in bedrock. This simplifies the geomorphological analysis of relatively recent sites, as their relationship to the river today is likely to be the same as their relation to it at the time they were occupied. How long the river has been entrenched in this location is not known, and it would take analysis of the locations of sites of known age in order to estimate how long it has been entrenched.

The geomorphological analysis was performed by Dr. David May. His efforts included analysis of the terraces, alluvial sequences and paleosols at Wilson Lake enabling us to understand the paucity of prehistoric sites there. His work was supplemented by an analysis of the opal phytoliths in the alluvial deposits. This was done by Steven Bozarth, who was a member of the field crew and who happened to have the expertise required. He collected phytolith samples from the same exposures that May analyzed so that the vegetational history derived from the phytolith analysis could be compared to the climatic reconstruction offered by the geomorphologist. The results, as reported in Chapter 6, were instructive.

Methods

Literature Search

It is not customary to list the literature review as one of the methods used in an archeological survey project, but in this case, the literature review consumed a great deal of the effort expended and provided some of the most valuable results. It included a summary of the ethnohistoric and historic literature. A large number of significant events and processes occurred in the early years of Lincoln and Russell counties. Numerous early explorers--French, Spanish, and American--passed through. Their diaries, journals, and maps were reviewed and the background materials read. Numerous Indian tribes were in the area, including the Pawnee, Kansa, Padouca, Otoe, Potawattomie, Sioux, and Cheyenne. Some of these fought one another in the vicinity of the project area. Later some of these tribes, especially the Cheyenne, raided the early Euro-American settlers. James R. Mead, one of the most important figures in the settlement of Kansas, lived in the vicinity. He was one of those who helped to hunt out the originally plentiful game.

What the literature review demonstrated is that the Pawnee trail (and other trails connected with it) are critical to understanding the history of the whole region. The majority of the early travellers to Santa Fe used this route rather than the one used after 1821. Most of the exploration of Kansas was done by Europeans who were led along these paths by Indian guides. Battles which pitted one tribe against another frequently happened on the trails; so did the later battles of

Indians against soldiers and Indians against caravans and settlers.

Aerial Photo Analysis

A variety of aerial photos of the Wilson Lake vicinity were acquired. Analysis of these focused primarily on the Pawnee trail. Dr. William Full of the Department of Geology at Wichita State University attempted to use computerized image analysis equipment for tracing the trail. Black and white photos of the area where the trail crossed the Saline River were analyzed, but the results were disappointing. On the south side of the river, a blacktop road follows most of the course of what used to be the trail. Elsewhere, it is often obscured by farm roads. In the few places where the trail seemed to be visible, the image could not be sharpened significantly using digitized imaging procedures. A larger section of the trail and multi-spectral images would be needed to provide any significant enhancement over what can be seen on the photos with the naked eye.

Interviews

Part of the fieldwork involved finding and interviewing people who had knowledge of local archeological sites and events of local history. To this end, we made sure that the survey was well-publicized in the local papers and asked that any interested parties contact us. Several people did so, with mixed results. It turns out that there are very few amateur archeologists in the area, and those we contacted did their collecting elsewhere. Several reported having tried unsuccessfully to find materials at Wilson Lake. All reported that the hunting was much better along the Smoky Hill River a short distance to the south.

The most valuable interview was with Oliver Cooper, whose family had owned the Cooper Gilt Edge Ranch. Mr. Cooper had not been to Wilson Lake since the property had passed from his family's hands, but he was able to identify several of the historic sites as belonging to the early phases of the ranch. He also could point out to us the exact location of the main branch of the Pawnee trail where it crossed the Cooper property. He said that the trail was still clearly visible when he was a boy. It appeared as a "torn up area" about 100 feet wide and ran down the east side of the valley which contains the distinctive sandstone formation known as "rocktown". Mr. Cooper's description coincided with other information available to us, but inspection of the spot on repeated occasions demonstrated that the trail can now be seen only under very favorable conditions of vegetation and light. We tried to photograph it, but without much success.

Field Methods

The shoreline survey of Wilson Lake began immediately after the notice to proceed in mid-June, 1985. Field headquarters were established in a rented house in Wilson, Kansas.

The field work was under the direct supervision of Robert Blasing and Hector Garcia. Dr. Donald Blakeslee visited the field on four occasions visiting sites of particular interest, and checking field procedures and crew records. Crew members included Linda Raftopoulos, Leslie Rounds, Loy Neff, James Wettstaed, Steven Bozarth, Gary Gimpel, and Kari Manz.

Field conditions during the survey were far from optimal. Because the growing season was far advanced, ground cover was very heavy, sometimes reaching a height of six to seven feet. In most of the survey area, ground visibility was essentially zero, necessitating the shovel testing discussed below. In only a minority of the areas with heavy ground cover did rodent burrows, ant hills, and mechanical erosion provide some visibility. Cultivated fields covered only a very small part of the survey area, mostly at the upstream (western) end. Even in cultivated fields, visibility of cultural material was low because of a lack of rain which resulted in a heavy covering of dust. Weather conditions on the other hand were generally good, with only one day lost to rain, and only a few days with temperatures over 100 degrees.

The survey provided intensive coverage of the strip of land lying between the conservation pool of 1516 feet above sea level and a line 12.6 feet above the lake surface, or a 1528.5 foot elevation. Approximately 100 miles of shoreline were involved, including low-lying marshy areas, pastureland, plowed fields, closely-mown recreational areas, sandy beaches, and rocky cliffs. In some areas, the topography limited the survey area to a rocky cliff face; in others, it was broad and flat. One person walking right at the edge of the water would carefully check cut banks for cultural material and also record any paleosols which might be of use in environmental reconstruction. Whether the shoreline was stable or was subject to erosion or deposition was also recorded.

As the perimeter of the lake was walked, the width of the area to be surveyed changed constantly. This necessitated both a standard means of ensuring that the whole survey area was covered and constantly changing means of providing adequate coverage of the area that was surveyed. Control over the boundary of the survey area was provided by using Brunton compasses as sighting levels. A tall crew member standing on the lakeshore would make a level sighting inland, and another crew member standing at the spot thus determined would do the same, yielding a second sighted spot roughly 12 feet above the lake level. At all times, the crew took care to survey a

ribbon of land from the shore to a spot several feet higher than the one determined by this method.

In addition to the excess land that this precaution added to the survey area, other spots were also surveyed occasionally. At some points with vertical banks, the first walkable shoreline was far more than 12.6 feet above the mean pool level. Since these spots had to be traversed anyway, the usual pattern of survey activities was continued across them. At other times, mounds or cairns outside the survey area but on government property were recorded when they were noticed. Other spots were surveyed because local informants mentioned the presence of petroglyphs or because we were investigating the probable route of an Indian trail.

Because the width of the ribbon of land to be surveyed varied a great deal over the course of a day, no standard pattern of surveying could be maintained for long. Particular care was taken, however, to ensure adequately close spacing of transects and shovel tests. The tests were never more than 30 meters apart along any transect, and the transects were never spaced more than 15 meters apart. In sections of shoreline where the survey area was narrow, two or more crew members would walk a single transect in leapfrog fashion, with one person digging a shovel test while another walked ahead to the next spot to be tested.

The shovel tests made were roughly 30 cm square and 30 cm deep where depth to bedrock allowed digging that deep. A block of earth would be cut from the earth and overturned. Soil in the bottom of the pit would be scraped by shovel, and the plug of soil taken from the hole would be shaved down in thin slices, looking for cultural material. The holes were then refilled. A crew chief carried an Oakfield coring device that takes a 3/4 inch core three feet long. This device was used to probe for buried cultural zones where the soil was deeper than 30 cm. When overhangs or potential rock shelters were encountered in the sandstone cliffs, additional 30 cm square shovel tests were taken under, or as near to these cliffs as possible.

Each crew member kept detailed notes of daily activities. These include information about lithic raw materials, flora (especially edible plants), fauna, and shoreline conditions. A special effort was made to record those areas of the shoreline that are actively eroding, as these are the spots where the threat to cultural resources is the highest. These, and such cultural resources as standing stone fences, were recorded on USGS 7.5 minute quadrangle maps. During the pedestrian survey, notes were kept on all inaccessible areas such as islands and steep cliff faces along the shore. Upon completion of the pedestrian survey, a 50 h.p. ski boat was rented and used to return to these areas and examine them properly.

When an artifact was found, the finder marked it on a 7-

1/2' USGS topographic map which each crew member carried. While he was describing this in his notes, other crew members performed an intensive survey of the immediate area at approximately three-meter intervals. If more artifacts were found, a map was drawn of the area and photographs were taken. All artifacts were bagged, and each bag was labeled with a tentative site number, legal description of location, finder's initials and date, as well as a brief description of the finds.

An attempt was made, during weekends or in the evenings, to contact any local residents who might have useful information on the project. These people were contacted by several methods. First, news releases were given to all area newspapers. These included our local address and phone number, and a request for anyone with information to contact us. Second, during our regular activities of buying groceries and supplies, picking up mail, etc., we asked local people we came in contact with what they knew about area history, or if they knew others who could provide useful information. Once we had contacted the first couple of collectors, they gave us the best information on whom else to contact in the community.

Laboratory analysis

Standard laboratory procedures were used to clean and catalog the specimens collected. These were so few in number that most of the laboratory work was completed during the field season. After washing, the specimens were labelled with the trinomial site numbers. The collections were then listed on catalog sheets, and the few that required other analysis were put aside.

Additional analysis was limited primarily to determination of ceramic temper and lithic provenance. The former was determined by examination under a 10X hand lens, using a freshly broken edge on the sherd. Lithic provenance was determined using the comparative collection at Wichita State University. Macroscopic comparison with known lithic types was the only method used. While this can produce misleading results in some cases, many of the lithic sources in Kansas and surrounding states differ clearly from one another in rather obvious ways. When the source of a given specimen was not obvious, it was classified as unknown. Description of the laboratory techniques used in the geomorphological and phytolith analyses are given in the next chapter.

Arrangements have been made with the Department of Anthropology at The Wichita State University for curation of the specimens and records. The specimens have been stored in boxes labelled with the site numbers and "Wilson Lake Survey."

V.

RESULTS: THE NATURAL ENVIRONMENT

Introduction (by Donald J. Blakeslee)

Archeological sites are not created in a vacuum but are related to specific environmental settings. Since the sort of archeological survey and testing performed at Wilson Lake is not apt to provide, by itself, a clear record of the past environments of the region, the project included some studies designed to elicit such information directly. Dr. David May performed a brief geomorphological investigation of the Wilson Lake area. The purpose was to relate the landforms at Wilson Lake, and especially the alluvial deposits there, to what is known for the Central Plains in general. His report is included as the first part of this chapter.

Steven Bozarth, a member of the field crew, had expertise in the analysis of opal phytoliths. These are silica bodies created in certain plants. Some are identifiable to plant family or even genus level by distinctive shapes, much as pollen can be identified. We took advantage of Bozarth's knowledge by having him analyze phytoliths from one of the exposures studied by the geomorphologist. His report is included as the second part of this chapter. Discussion of how the geomorphological and phytolith analyses relate to the archeological record is included in the summary of the chapter.

Geomorphology (by David W. May)

Introduction

River valleys contain a wealth of information about changes that have occurred in the surrounding landscape because they are temporary storage sites for water-transported sediment. Deposition of sediment, or valley alluviation, and the erosion of stored sediment, or valley incision, can best be explained by changes in the volumes of surface runoff and sediment supplied to a valley. Changes in the volumes of surface runoff and sediment supplied to a valley at time scales of thousands of years are most likely the consequence of climatic changes (Langbein and Schumm 1958; Schumm 1965; Knox 1983). Valley alluviation occurs when greater volumes of sediment are supplied to a stream network by sheetwash, rilling, gullying, and mass wasting of hill slopes than it can transport from the basin (Knox 1977; Trimble 1981). Sediment is stored on the valley bottom and in fans at the mouths of small tributary valleys (Costa 1975; Knox 1977). These alluvial deposits are collectively an alluvial fill.

Vertical accretion on floodplains is greatest when flooding is severe. In a sub-humid to semi-arid region, such as the Central Great Plains, flooding is a consequence of a precipitation regime of infrequent and intense convective storms (Baker 1976). In central Kansas, flash flooding can be produced by a decrease in precipitation, an increase in summer temperatures, or both. When annual precipitation decreases, the density of the grass cover is diminished (Langbein and Schumm 1958), and surface runoff to gullies, streams, and rivers is increased. Knox (1972) has used streamflow records from the Midwest and Central Great Plains to demonstrate that the magnitude of the 50-year flood increases more than three-fold along a humid to semi-arid transection from Wisconsin to eastern Colorado. It is likely that during Holocene droughts in the Central Great Plains the magnitude and frequency of flooding increased similarly. The erosion of hillslopes by rilling and gullying also would have increased as surface runoff increased. Therefore, during Holocene droughts in the Central Great Plains, the amount of sediment supplied to stream networks increased, but because of both reduced annual stream discharge and increased flash flooding, this eroded sediment was stored in valleys rather than transported from basins.

A river incises and laterally erodes alluvial fills when stream energy exceeds the amount of energy required to transport the sediment supplied to the drainage system through erosion of the uplands. That is, incision, and the concomitant conversion of the floodplain to a terrace, is a response of the drainage system to lower sediment concentrations. Lower sediment concentrations, and in semi-arid regions, lower yields of sediment from basins as well, are a consequence of increased annual runoff (Langbein and Schumm 1958). Greater annual streamflow is produced by less variable and greater annual precipitation. Both an increase in annual precipitation, and a more regular distribution of precipitation during the summer, promote growth of a denser grass cover in semi-arid and sub-humid regions. With an increase in grass cover, more precipitation is intercepted, overland flow is retarded, and infiltration is enhanced. Therefore, baseflows of streams are greater and floods are much less common during periods of greater annual precipitation.

In summary, alluviation of valleys and burial of soils developed in alluvium during the Holocene are evidence of increased flash flooding and can be used to infer climatic change in Kansas to a regime of less frequent and more variable precipitation, higher temperatures, or both. Conversely, stream terraces in the Central Great Plains are evidence of incision caused by greater annual discharge and lower sediment concentrations, and can be used to infer climatic change to a regime of more frequent storms and greater annual precipitation.

Valley Alluviation, Soil Development and Climatic Inferences

In response to climatic changes toward less effective precipitation and the concomitant changes in the supply of both sediment and water to streams, flooding and sheetwash from valley-side slopes fill valleys with alluvium. Valley alluviation is rapid at first, but within tens of years an alluvial channel in a semi-arid environment adjusts to the changed input of sediment and water (Schumm and Lichty 1963; Wolman and Gerson 1978). The surface of the floodplain then receives very little sediment during flooding (Wolman and Leopold 1957; Nanson and Beach 1977; Nanson 1980). As alluviation wanes, a soil can develop in the upper part of the stable alluvial fill. The soil will develop until it is rapidly buried or eroded during a subsequent episode of channel adjustment to a changed regime of runoff and sediment supply. When the river again reaches a state of quasi-equilibrium, another soil can form on the stable valley bottom, whether it is on the floodplain then being constructed, in a gully bottom, or in an abandoned channel of the river. Thus, the resulting soil, when preserved by burial and subsequently exposed, delineates the former morphology of the valley. Therefore, the alluvial history of a valley can be deciphered from buried soils as well as from erosional disconformities.

The physical and chemical properties of buried soils that are developed in alluvium, as well as their spatial extent, can be used in reconstructing paleoclimates. The properties of absolutely-dated buried soils can be used to infer past climates where the other factors of soil formation, relief, parent material, and vegetation, have varied little (Jenny 1941; Birkeland 1984). For late-Pleistocene and Holocene soils buried in alluvium, two soil properties useful for paleoclimate reconstructions are particle-size distribution and organic-carbon content (Hoyer 1980b; Reider 1982).

The particle-size distribution of each horizon of a soil developed in alluvium may reveal the relative contributions of flooding, time, and climate to soil genesis. If the particle-size distributions of soil horizons show a consistent fining upward, then insufficient time has passed for weathering and the downward movement of clay to mask the texture of the alluvial parent material. For well-dated soils developed in similar-textured alluvium, the relative role of climate might be inferred from the degree to which clay has accumulated below the former floodplain surface. However, in the sub-humid and semi-arid Great Plains, the low frequency of rainfall limits weathering and clay migration. Therefore, Holocene soils often show little evidence of downward clay movement. The vertical textural changes of the alluvial parent material can still be used to document the relationship of flooding to soil formation, even though the only evidence of soil formation may be the development of an A horizon.

The total organic carbon present in a buried Holocene soil is a function of the combined effects of plant species and total biomass on a former valley floor, as well as, perhaps, the frequency of fire in the basin. Soil organic carbon is likely a first approximation of past rainfall and temperature regimes, because grass species and density reflect, in part, climate. Alternatively, organic carbon in buried soils may be a function of the length of time the surface on which the soil developed was stable, or a function of the degree of oxidation subsequent to burial.

The Evidence

Around the upper end of Wilson Reservoir three terraces can be identified. These three terraces are 16, 13, and 8 meters above the bed of the former Saline River. Site 14RU521 is on the highest of these three terraces, and site 14RU524 may be on a small remnant of this terrace. Site 14RU519 is on the second terrace. No sites were reported from the lowest of the three terraces.

The absolute age of the terraces is unknown. Erosion during the past 2000 or 3000 years is certainly responsible for much of the relief on all of the three alluvial landforms. At site 14RU521 the erosion may have been much more recent. Four holes were cored to a depth of 130 cm around the perimeter of the surface concentration of artifacts at site 14RU521. The relationship between the morphology of the terrace and the stratigraphy of the alluvial fill comprising the landform revealed that the terrace had been severely eroded prior to occupation of the terrace. The depth of an alluvial sandy gravel unit varied from more than 130 cm at core hole #1 on the crest of the eroded terrace remnant, to as little as 50 cm at core hole #4 at the toe of the erosional slope northeast of site 14RU521. If the sandy gravel alluvial unit in the fill comprising the terrace is assumed to have been deposited at the same elevation during the lateral migration of the Saline River across the valley, then a meter or more of the surface of the alluvial fill has been eroded at this site in perhaps the past few hundred years. Neither the absolute age nor the duration of this episode of erosion can be determined exactly, but from the little organic matter in the soil at the base of the slope at site 14RU521, it is evident that little time has elapsed since the surface stabilized at this Middle Ceramic site.

It is not surprising that neither the terrace remnant on which 14RU521 rests is being rapidly eroded, nor that it was chosen as a habitation site. This narrow remnant of the highest terrace extends far north out into the Saline Valley and was, until very recently, being attacked by the Saline River from both the west and east as it snaked back and forth across the valley. This high narrow terrace remnant would have afforded both a good view of the valley, as well as convenient access to the river.

No estimate of the age of the fill comprising the highest terrace can be made directly from the remnant of fill at site 14RU521. However, based only on the elevation of terraces in the Saline and Smoky Hill valleys, and a potentially dangerous extrapolation from one drainage basin to another, the alluvial fill comprising the highest well-preserved terrace in the Saline River valley may date from the early or middle Holocene (10,000 to 3500 radiocarbon years before present (RCYBP). (See Rogers 1984).

The second highest well-defined terrace in the Saline River valley in the vicinity of Wilson Reservoir is also an alluvial-fill terrace. The best exposure of the fills comprising this terrace is just southeast of an old cemetery in the center of Section 24 in Township 12 South, Range 13 East. There are three alluvial fills exposed in this long cutbank on the north shore. The oldest consists of crossbedded sand and gravel. This fill has been extensively quarried around the upper end of the reservoir. Inset against this fill is a finer-textured fill, the base of which has been radiocarbon dated at 1940 \pm 70 years B.P. A soil formed in the upper part of this second alluvial fill, as well as on the eroded surface of the gravelly fill. A third alluvial fill that is coarser than the second, but not as coarse as the oldest, overlaps both the older fills.

The lowest easily-identifiable terrace in the Saline River Valley is a terrace cut into several alluvial fills. Although the surface of this terrace along the north shore of the upper end of the reservoir is only about 8 meters above the bed of the former Saline River, some of the alluvium comprising this terrace is 5000 years old. At a cutbank in the northeast 1/4 of the south 1/4 of the southeast 1/4 of Section 31, cutbank #1, humus from the buried A horizon of a soil less than two meters below the surface of this lowest terrace has been radiocarbon dated at 5090 \pm 60 years B.P. Clearly, the morphology of the Saline River Valley is not by itself sufficient for estimating the age of alluvium comprising alluvial terraces in the valley.

The stratigraphy of the alluvium comprising cutbank #1 and of that comprising two of the fills at the cemetery cutbank was radiocarbon dated and studied in detail for the following purposes. First, to demonstrate the existence of multiple Holocene alluvial fills within the Saline River Valley. Second, to absolutely date the different fills in the Saline River Valley. Third, to demonstrate the young age of the coarse-textured alluvium found at the surface along much of the shore of the upper end of Wilson Reservoir, and therefore, the lack of any Archaic or Paleo-Indian archeological sites near the surface. Fourth, to estimate the magnitude and timing of climatic changes on the Central Great Plains from the physical and chemical properties of alluvium of different ages and from the soils developed in it. The methods used in this phase of the geomorphological investigation of the Wilson Reservoir

shoreline are given next, followed by the results of this phase of the study.

Methods

Two cutbank exposures, cutbank #1 and the cemetery cutbank, were described according to Chapter 4 of the revised Soil Survey Manual (USDA 1981). Both alluvial units and soil horizons were delineated and described. The cutbank exposures were sampled from bottom to top. The sampling interval was based on the boundaries of alluvial units where no soils were present, and on horizon boundaries where soils were present. One sample was collected from alluvial units and soil horizons of less than 30 cm thickness, and three evenly-spaced samples were collected from units and horizons thicker than 30 cm.

The samples were analyzed for particle-size distribution by the Day (1965) method. The sand fraction was sieved at 1/4 phi intervals, and hydrometer readings were taken at intervals that would also produce a particle-size distribution at 1/4 phi intervals. The percentage of sand, silt, and clay fractions were calculated for each sample, as were several statistics (Appendix I). The organic-carbon content of each sample was determined by the Walkley-Black Method (Allison 1965).

Results

The results of the particle-size and organic-carbon analyses of samples collected from cutbank #1 along the north shore, and the cemetery cutbank along the south shore of Wilson Reservoir are presented in Figures 3 and 4. Only the percentage of sand and clay in each sample are illustrated, because these two fractions usually contain the most information on alluvial sedimentary environments, and because the percentage of silt is the difference between 100 and the sum of the percentages of sand and clay. The percentage of organic carbon in each sedimentary unit or soil horizon is presented rather than soil organic matter, because alluvial sediments may contain charcoal that floated in from grass fires upvalley or upslope.

The particle-size data for samples from the upper 2.4 m of cutbank #1 at Wilson Reservoir (Fig. 3) reveal that two alluvial fills comprise the lowest terrace of the Saline River at this site. The alluvium fines upward from 240 to 90 cm below the terrace surface, and becomes especially very-fine textured, containing as much as 72% clay, between 138 and 90 cm. Although clay content drops between 90 and 66 cm below the terrace surface, the sand content shows little change. Therefore, this alluvial unit is considered part of the lower of the two fills at this site. In the overlying alluvial fill the percentage of sand increases progressively from 5% at 66 cm below the surface, to 37% at the surface of the terrace. This indicates that flooding of the Saline River Valley increased during deposition of this fill.

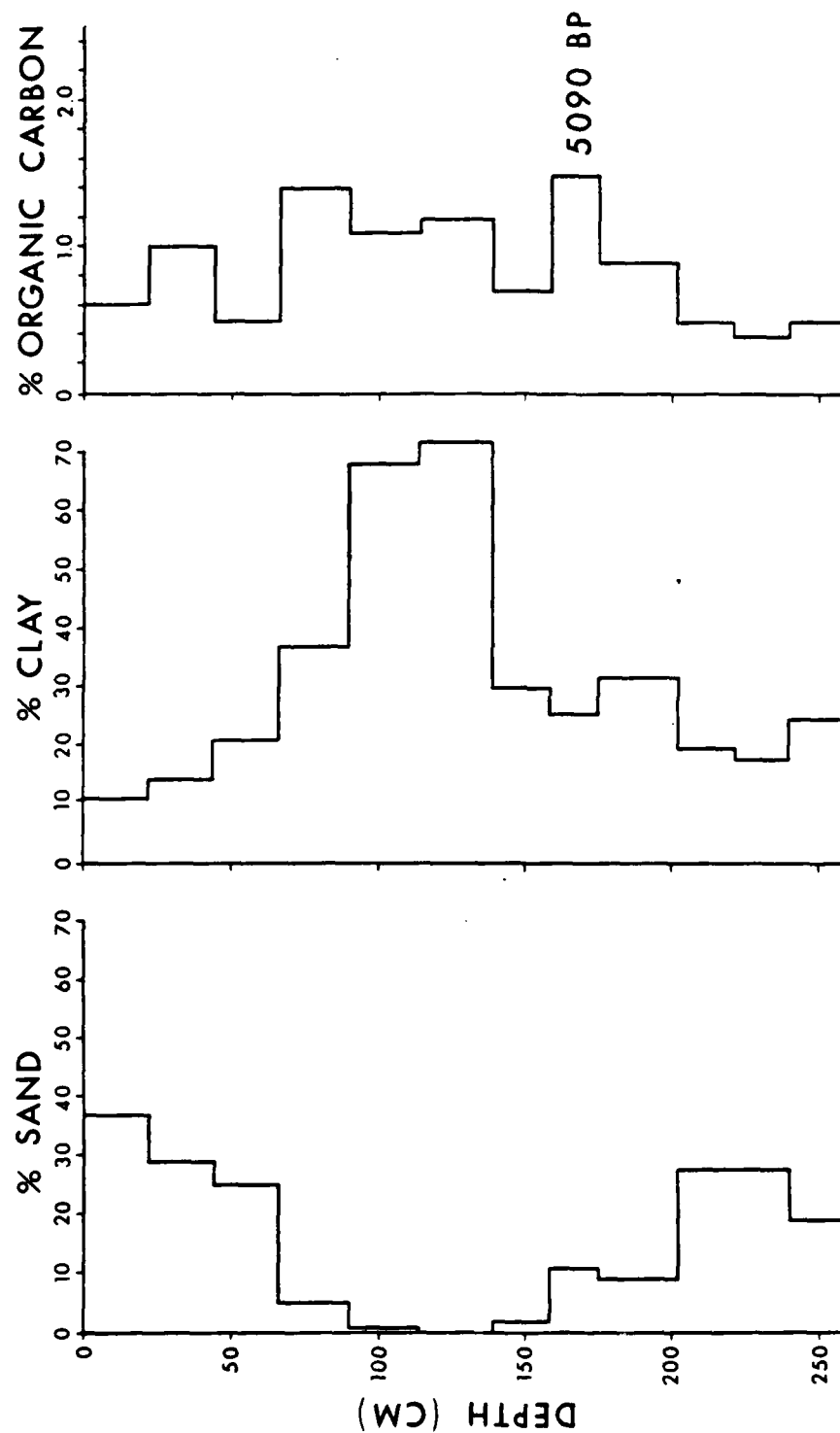


Figure 4. Particle-size and organic-carbon distribution with depth at cutbank #1.

The organic carbon profile for cutbank #1 shows three organic-rich alluvial units below the soil at the surface. The lower two of these units contain at least 1.4% organic carbon and are both comprised of less than 10% sand. The upper organic-rich zone is comprised of 37 to 72% clay, while the lower unit is comprised of 62% silt. Are these dark-colored, organic-rich units the buried A horizons of soils that developed in situ under a dense cover of grass during times of greater effective moisture, or are these deposits of organic-rich alluvium eroded from the floodplain or derived from adjacent hillslopes? If they are soils, then there need not be a positive correlation between organic-rich units and fine-textured alluvium. Furthermore, independent evidence that these units were deposited during or immediately preceding a more mesic interval on the Great Plains would be evidence that these units are buried A horizons of soils. Greater effective precipitation would lead to a denser cover of prairie, and this would have the direct effect of providing more organic debris to the alluvium, as well as the indirect effect of retarding surface runoff and thereby reducing flooding of the floodplain on which the soil was developing.

The lower of the two organic-rich horizons at cutbank #1 is probably the buried A horizon of a soil based on the following two pieces of evidence. First, the lower boundary of the organic-rich unit from 158-175 cm is a clear boundary; that is, the change from the organic-rich horizon to the next lower sedimentary unit occurs over a depth of 2.5 to 5 cm. The boundary between the unit is clear rather than abrupt (i.e. with a transition zone) because the units were mixed by burrowing animals and worms, a soil-forming process. Second the sedimentary unit from 175-202 cm contains less organic carbon than the overlying unit, but the particle-size distribution of the two are almost identical. If the organic-carbon distribution with depth was solely a function of deposition, then these units should both contain the same amount of organic carbon. Because the organic carbon content of the unit from 175-202 cm is intermediate between that of the overlying and underlying units, this unit is a buried AC soil horizon. The underlying parent material of the soil, the C horizon, contains only about 0.6% organic carbon.

The analyses of phytolith samples (see Bozarth, this report) from cutbank #1 may be, in part, inconsistent with the interpretation that the units 158-175 and 175-202 cm are the buried A and AC horizons, respectively, of a soil. The ratio of Pooid phytoliths to Chloridoid phytoliths, which Steven Bozarth considers to be positively correlated with available moisture, was lowest in the phytolith sample from 164-169 cm. This inconsistency in the evidence of paleoclimate from cutbank #1 is not easily reconciled, but it may indicate that time was a much more important soil-forming process than climate for the lower of the two buried soils at cutbank #1. The single radiocarbon date of 5090±60 years at this site from this soil does not resolve the problem of the relative importance of time

and climate to soil formation on the floodplain of the Saline River.

There are also two pieces of evidence that the organic-rich unit from 66-90 is an A horizon of a buried soil. First, the organic-carbon content of the 66-90 cm unit is higher than that of either of the two units immediately below, even though the alluvium comprising the upper of the three units is coarsest. Second, two indices of effective moisture based on percentages of different plant phytoliths from the alluvium and soils exposed in the cutbank (see Bozarth, this report) both indicate that the organic-rich zone between 60 and 90 cm developed during a moist interval at the site. Therefore, although slow alluviation may, in part, explain the high organic-carbon content of the alluvium between 66 and 90 cm deep, it is best explained by an increase in effective moisture around Wilson Reservoir shortly after the unit was deposited.

The occurrence of 1% organic carbon in the unit between 22 and 44 cm within the coarsening upward sequence of the second alluvial fill exposed in cutbank #1 may be a consequence of the overbank deposition of eroded floodplain and upland soils rather than in situ soil development. Bozarth (this report) reports that sponge spicules were found in phytolith samples from 20-25 cm and 55-60 cm. Bozarth concludes that the presence of sponge spicules in the near-surface samples is evidence of overbank deposition. The presence of sponge spicules in only the samples containing more than 9% sand (those above 60 cm and below 185 cm) is consistent then, with the sedimentological evidence of the flooding history of the Saline River during the last 5000 years.

In summary, the fining upward of the alluvium comprising the basal alluvial fill indicates progressively decreasing flooding. The lowest buried A horizon (3Ab) formed on a stable floodplain during perhaps a more mesic episode of the middle Holocene. The second buried A horizon between 90 and 66 cm (2Ab) formed following a long interval of slow floodplain accretion and also during a mesic episode of the middle or late Holocene. The coarsening upward of overlying alluvial fill indicates progressively increasing flooding. The organic-rich unit from 22-44 cm may consist of several organic-rich flood deposits derived from erosion of the floodplain elsewhere in the Saline River Valley.

The particle-size distribution with depth (Figure) from the cemetery cutbank reveals the presence of two alluvial fills beneath the second highest terrace in the Saline Valley in the vicinity of Wilson Reservoir. The lower alluvial fill generally fines upward from the base of the sampled section (332 cm) up to 141 cm below the terrace surface. It is especially fine-textured between 228 and 141 cm. The high sand content between 300 and 264 cm is a consequence of the very local erosion of the adjacent gravelly valley fill that is likely older than 10,000 years. The upper of the two alluvial

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ALONG THE PANNEE TRAIL: CULTURAL RESOURCE SURVEY AND
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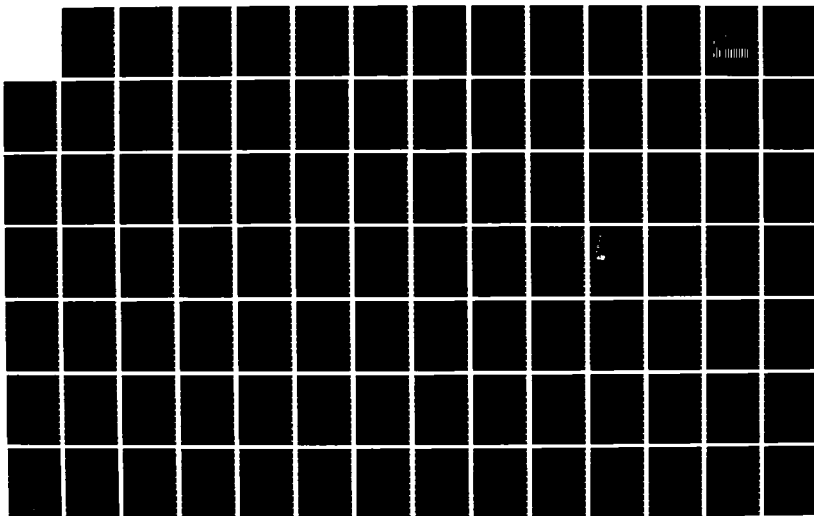
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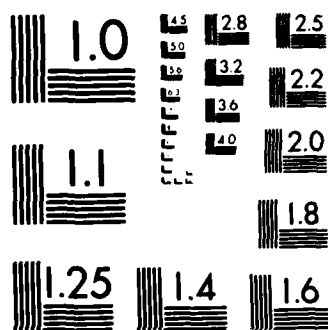
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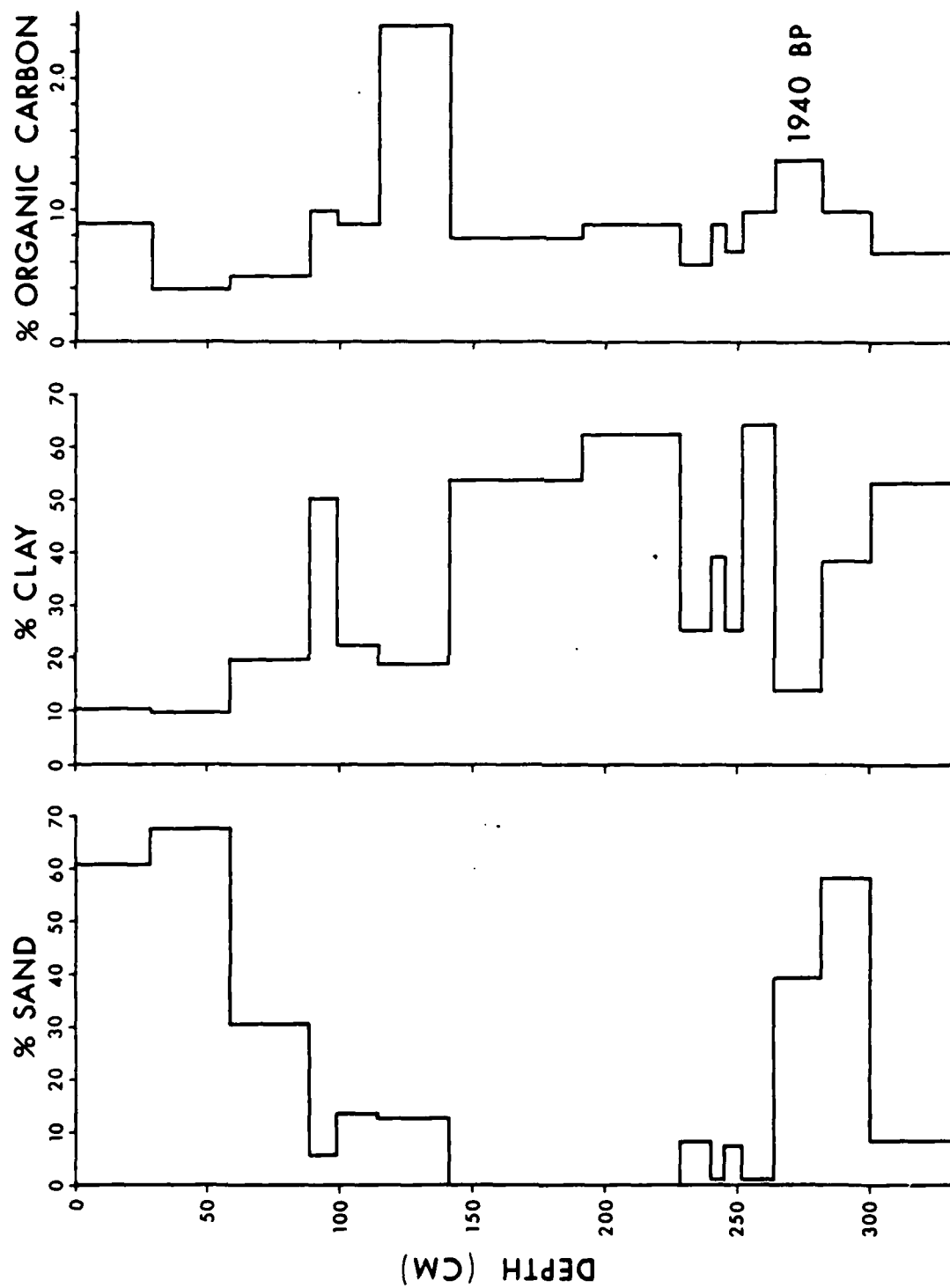


Figure 5. Particle-size and organic-carbon distribution with depth at cemetery cutbank.

fills coarsens upward as at cutbank #1; this fill is probably the same as the upper fill at cutbank #1.

Two buried soils are present at the cemetery cutbank. The lower buried A horizon (3Ab) contains 1.4% organic carbon and is developed in silty sandy alluvium. It was radiocarbon dated at 1940 \pm 70 years B.P. This soil can be traced along the cemetery cutbank from the base of a tributary valley fill where it was sampled and dated eastward along the contact between the Pleistocene gravelly fill and the youngest alluvial fill. The continuity of this organic-rich horizon and the relief on the surface at which it developed, attest to it being a true buried soil, and not simply an organic-rich depositional unit.

The upper organic-rich horizon, 141-114 cm, is also the buried A horizon of a soil (2Ab). This alluvial unit contains 2.4% organic carbon, a very large amount to be eroded, transported, and concentrated in a 27 cm-thick alluvial unit. Furthermore, this unit is coarser textured than underlying units, so should contain less organic carbon if redeposition is responsible for the organic carbon in these alluvial units.

Regional and Climatic Significance

The soil dated at 5090 \pm 60 years B.P. at cutbank #1 on the south shore of Wilson Reservoir formed after an episode of alluviation of the Saline River Valley. Both valley alluviation and soil genesis were likely in response to an increase in effective moisture in the Great Plains at about 5000 years P.B. Fossil-pollen evidence in both northeast Kansas and north-central Nebraska indicates such a change to greater effective precipitation about 5000 years B.P. The pollen percentages from the core at Muscotah Marsh (Figure , site MU) record the onset of a cooler, moister climate at 5100 years. At the present site of Hackberry Lake in the northern Nebraska Sand Hills (Figure 5, site HL) the percentages of arboreal pollen were highest, and of grass pollen lowest, 5040 years B.P. (Sears 1961).

Alluviation of many valleys in the Central Great Plains slowed dramatically at 5000 years B.P., and soils formed on floodplains for the first time in nearly 2000 years. For instance, alluviation on the Cherokee Fan on the eastern margin of the Great Plains (Figure 5, site CH) ceased prior to 4615 years, and a soil then formed on the stable surface of the fan. This dated soil was the first to form on the fan in 1700 years, suggesting both that the fan surface was episodically flooded and accreting, and that less moisture was available for soil development on the fan (Hoyer, 1980, Table 2). Furthermore, some of the coarsest sediment in the fan was deposited after 6300 and before 4615 years B.P. (Hoyer 1980, Fig. 2.7).

In the South and Middle Loup River valleys in central Nebraska soils developed in alluvium at about 5000 years B.P.

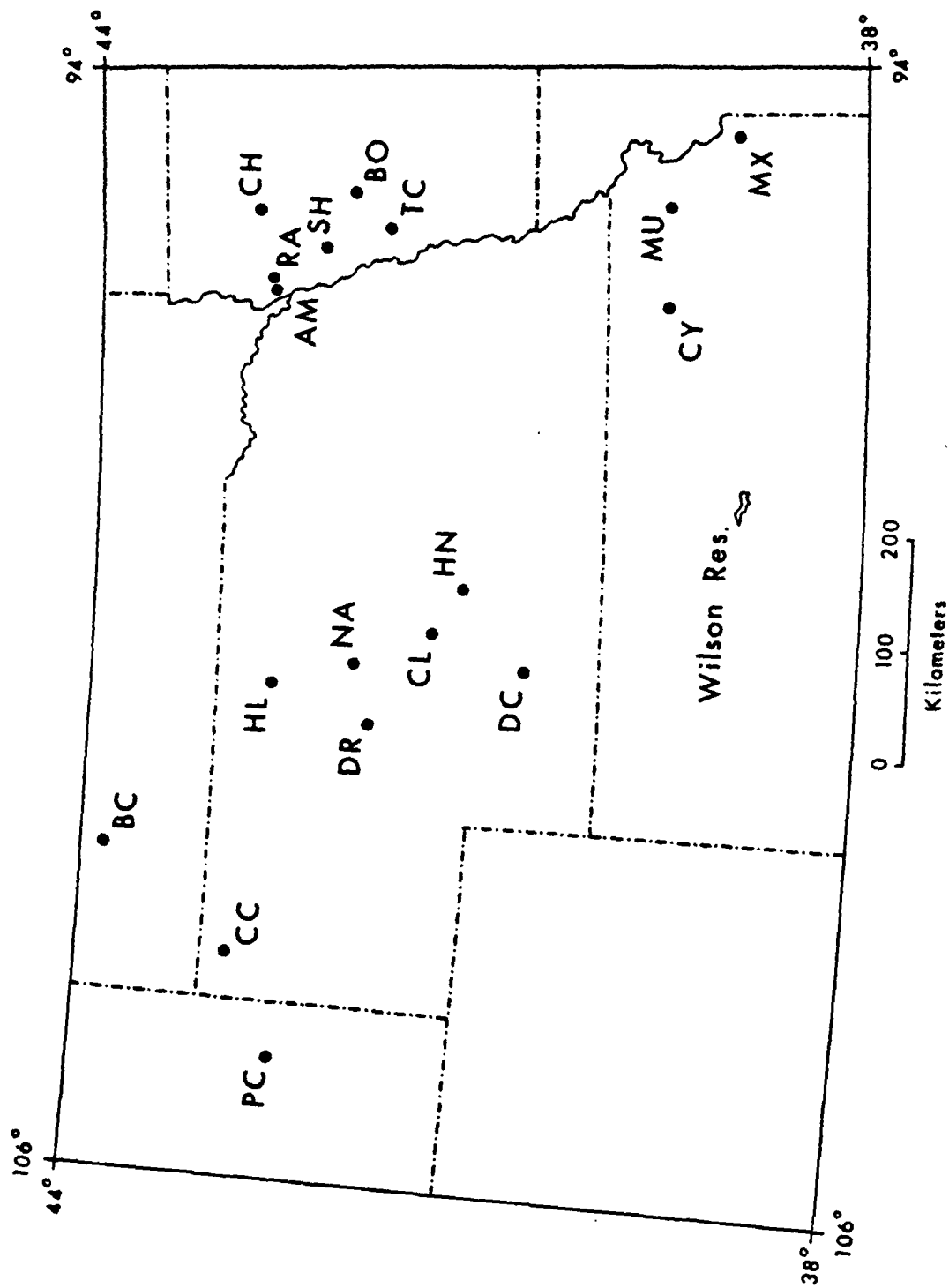


Figure 6. Sites in the Central Plains with radiocarbon dates similar to those from cutbank #1 and cemetery cutbank at Wilson Reservoir.

In the South Loup Valley at the Horn cutbank (Figure 5, site HN), the lowest 5 cm of an A horizon buried 2 meters below the surface of the Cumro (Elba) Terrace has been dated at 4780 years B.P. (May and Hollen 1985a). This soil marks the end of a long hiatus in the development of thick soils on the floor of the South Loup Valley. Nearly six meters of alluvial sand and silt separate the base of the 4780-year-old buried soil. At the Horn cutbank, as at the Cherokee Sewer site in western Iowa, soil development was apparently limited by both moisture and alluviation of the valley floor for more than 2000 years. Similarly, in the Middle Loup drainage (Figure 5, sites DR and NA) alluvial sand enriched in organic matter has been radiocarbon dated at 4900, 5040, and 5150 years B.P. (Ahlbrandt, et al. 1983, table 3). However, only 13-35 cm of alluvium accumulated at one of these sites between 8410 and 5150 years B.P. Apparently, while the South Loup Valley was alluviating during the Middle Holocene, the Middle Loup Valley was stable. From the 10 radiocarbon dates between 8410 and 3000 years B.P. that Ahlbrandt and others (1983) have reported for Holocene alluvium in the Middle and Dismal River valleys, it is apparent that none of the alluvium in these valleys was enriched with organic matter between 7200 and 5150 years B.P. Therefore, soil development on valley bottoms throughout the Central Great Plains between 7000 and 5000 years B.P. was apparently limited by low amounts of moisture and not by burial of stable valley bottoms.

In northern Kansas the alluvial chronology of the Blue River at the Coffey site (Figure 5, site CY) indicates that a meander of the Blue River was abandoned prior to 5355 years B.P. The abandoned channel filled with sediment between 5355 and 5030 years B.P., based on 11 radiocarbon ages of charcoal that were considered by Schmits (1980) to be the most reliable dates from the site. Farther downstream in the Kansas River drainage other than cutbank #1 at Wilson Reservoir stabilized at 5000 years B.P. From the radiocarbon-dated chronologies of erosion, alluviation, and soil formation at about 5000 years B.P. in valleys of the Central Plains, I conclude that precipitation increased there at 5000 years B.P. I infer this increase in precipitation from two pieces of evidence. First, floodplains stabilized 5000 years B.P. after a brief episode of lateral migration of channels, and presumably, adjustment of the drainage networks to a new flooding regime. Second, the soils developed in 5000-year-old alluvium are richer in organic matter than any developed in the previous 2000 years. Furthermore, the palynological evidence in cores from Muscotah Marsh and modern Hackberry Lake support the sedimentological and soils evidence of an increase in effective moisture in the Central Plains at 5000 years B.P.

The soil at the cemetery cutbank on the north shore of Wilson Reservoir that is radiocarbon at 1940 \pm 70 years B.P. developed on the floor of a short tributary valley to the Saline Valley following widespread gullying in the basin. This episode of gullying occurred in small valleys in the Central

Great Plains from eastern Wyoming to western Iowa, but the timing of this episode of erosion was time transgressive within at least individual drainage basins. That is, within individual watersheds headward erosion proceeded episodically for at least several hundred years (Mandel and Bettis 1985). Therefore, the location of a dated soil or alluvial disconformity within a drainage basin partly determines its age. Consequently, the dates for this episode of erosion and downvalley alluviation are not synchronous throughout the Great Plains.

In eastern Wyoming at the Pattern Creek archeological site (Figure 6, site PC), charcoal 15 cm below an erosional unconformity is 1790±180 years B.P. (Haynes and others 1966). In southeastern South Dakota the floodplain of a tributary to the Cheyenne River (Figure 6, site BC) was stable 2350 years B.P., but was deeply incised sometime soon after then (Harksen 1974). Some of the very earliest radiocarbon dates (Libby 1955), which no longer are accepted as accurate by many, indicate that soils formed on the stable floor of Cedar Canyon in northwestern Nebraska (Figure 6, site CC) at 2049 and 2149 years B.P. In southwestern Nebraska, radiocarbon-dated wood 120 cm below the surface of a fill terrace dates an episode of erosion and alluviation in the Medicine Creek Basin (Fig. 6, site DC) at 2200±180 years B.P. (Brice 1966). In the South Loup Valley of central Nebraska (Figure 6, site CL) episodic erosion of a 3000-year-old alluvial fill started before 1660 years B.P., and lasted until then (May and Holen 1985b). At several localities in very small watersheds in western Iowa (Figure 6, sites AM, RA, SH, BO, and TC) erosion and alluviation have been dated at between 2340 and 2000 years B.P., although erosion and deposition occurred as early as 3400 B.P. in other parts of some of these drainages (Bettis and Thompson 1982; Mandel and Bettis 1985).

In the lower Kansas River system (Figure 6, site MX) a deeply-buried stable floodplain has been dated at 2395 years B.P. (Bender and others 1980; Johnson 1985). In the tributary valleys to the Kansas River, including the Saline River and its tributaries, buried soils that developed on stable floodplains have been dated at between 2000 and 1760 years B.P. (Johnson 1985). The timing of burial of these floodplains also varied. Johnson and others (1980) have suggested that soils in low terrace deposits in central and eastern Kansas, as well as northwestern Missouri, were buried 1900 years B.P. However, the soil at the cemetery cutbank at Wilson Reservoir did not begin to develop until 1940 years B.P. (adjusted date; unadjusted date is 1740). Similarly, a soil in an abandoned channel of the South Loup River began forming 1660 years B.P. (unadjusted date) (May and Holen 1985b). Burial of these soils and widespread alluviation of both the upper Saline Valley and of the South Loup Valley to the north are not likely to have occurred until a few hundred years later. These dated soils are in similar geomorphic positions in channel fills. Therefore, it is likely, but not necessary, that the soil at

the base of the gully fill in the Saline River Valley at the cemetery cutbank developed for 700 years, as did the soil in the South Loup Valley.

Phytoliths (by Steven Bozarth)

Introduction

When plant roots absorb water, they also take up silica in solution (Peterson 1983). Microscopic silica bodies are formed by the precipitation of hydrated silica dioxide ($\text{SiO}_2 \cdot n\text{H}_2\text{O}$) in, around, and between plant cell walls. Silica bodies produced in plants with characteristic shapes are called opal phytoliths (Wilding and Drees 1971). Phytolith is derived from the Greek words phyton, meaning plant, and lithos, meaning stone (Pease 1967). Opal is the common name for hydrated silicon dioxide (Parry and Smithson 1958).

Phytoliths are resistant to weathering and are preserved in most soils for long periods of time (Twiss 1978; Carbone 1978; Wilding 1967; Piperno 1984). There are many varied shapes and sizes of phytoliths due to the many different types of cells in any particular plant (Rovner 1975). Phytoliths are diagnostic when plant cells specific to a particular taxon are silicified.

The monocotyledonous plants, particularly the Gramineae, produce a wide variety of morphologically distinctive phytolith forms (Rovner 1975). These include silicified short cells, fundamental cells, bulliform cells, trichomes (prickle-hairs), and stomata. The short, fundamental, and bulliform cells are well preserved in soil. The trichomes are composed of two parts, an outer sheath and an inner core. The outer sheath dissolves soon after deposition in the soil, but the inner core remains well preserved. The silicified stomata are not well preserved.

Research by Rovner (1971, 1975) indicates that dicotyledonous herbs generally produce irregular, amorphous silica bodies of various sizes. However, more extensive research by Bozarth (1985) indicates that opaque, perforated, platelets and sculptured opal spheres with diameters greater than 30 microns are diagnostic of certain species of herbaceous dicots.

Arboreal dicot phytoliths usually consist of fragile, silicified cell walls (Wilding and Drees 1971) that have a rate of dissolution 10-25 times greater than grass phytoliths (Wilding and Drees 1974). Leaves from white oak (Quercus alba), sugar maple (Acer saccharum), American beech (Fagus grandifolia), American linden (Tilia americana), white ash (Fraxinus americana), and hackberry (Celtis occidentalis) produce opal spheres that range in size from about 50 microns

to less than 1 micron. Most lack surface detail but some have slight indentations or protrusions which are probably the sites of attachment to leaf cells. A number of opaque opal spheres similar to those from the trees mentioned above were extracted from the surface (A1) horizon on several forested soils in Ohio demonstrating that they are stable in soil. These opal spheres are apparently produced only by arboreal species (Wilding and Drees 1973, 1974). Large (50-180 microns), grainy phytoliths with reticulate sculpturing and opaque protrusions appear to be diagnostic of the fruit of hackberry (Celtis occidentalis) (Bozarth 1985).

Plant opal in conifer needles consists mainly of delicate intercellular silica (Norgren 1972), although all cell types in Pinaceae leaves may be heavily silicified, producing well-preserved phytoliths (Klein and Geis 1978). The most distinct difference between Pinaceae phytoliths and phytoliths in other plants is the presence of tracheids with bordered pit impressions and tapering ends (Klein and Geis 1978). Douglas fir (Pseudotsuga menziesii) needles produce distinctive, silicified asteroscleroids (Brydon et al. 1963; Norgren 1972; Klein and Geis 1978). Similar phytoliths have been found in British Columbia soils (Brydon et al. 1963).

Sponge spicules are another form of biogenic silica that are well preserved in soil. Sponge spicules are identified microscopically on the presence of an axial canal (Baker 1959; Jones and Beavers 1963). Complete spicules have tapering cylindrical forms which terminate in a pointed end (Jones and Beavers 1963). Abundant sponge spicules in soils are indicative of an aquatic habitat favorable for sponge growth (Jones et al. 1964). An abundance of undamaged sponge spicules suggests formation on or near the site (Smithson 1959). The presence of freshwater sponge spicules in Illinois loess is evidence that the loess was derived from river flood plains (Jones and Beavers 1963).

Diatoms are algae (division Chrysophyta, class Bacillariophyceae) that produce siliceous cell walls (Bold 1967) which are well preserved in soil. Diatoms occur in both marine and freshwater habitats and in some moist and dry habitats where the light, temperature, and chemical conditions are suitable for their growth (Patrick and Reimer 1966). Abundant diatoms in soil suggest a rich planktonic fauna and flora. Diatoms may comprise from 1/3 to 1/2 of the opal isolate of soils developed under ponded or poorly drained conditions (Wilding and Drees 1971). Trace amounts of diatoms in soil can be explained by aeolian transport (Jones et al. 1964).

Methods

Grass phytolith classifications have been developed by Brown (1984), Mulholland (1984, 1985), and Twiss and others (1969). Differences between these classifications in addition

to the fact that phytoliths from many plant taxa native to the Central Plains have not been studied necessitated developing a phytolith reference collection representative of Central Plains vegetation. Phytoliths were extracted from 17 species of Gramineae, four species from other monocot families, 17 species of herbaceous dicots, 12 species of arboreal dicots, nine gymnosperms, and one Equisetum species (Tables 1-5). Phytoliths were extracted from the reference plants with a procedure modified from Rovner (1971, 1972) using Schulze's solution (3 parts 70% nitric acid and 1 part saturated potassium chlorate) to oxidize the plant material. With the exception of most of the gymnosperms, these reference plants were selected because they are among the most common plants native to the Central Plains.

Analysis of the grass phytoliths demonstrates the following: saddle-shaped phytoliths are produced only in the Chlorideae, Erogoeae, and Aristideae tribes of the Subfamily Chloridoideae; bilobate, polylobate, and cross-shaped phytoliths are produced in the Andropogoneae and Paniceae tribes of the Subfamily Panicoideae and bilobates in the Aristideae tribe of the Subfamily Chlorideae; certain types of trapezoidal phytoliths are produced only in the Poeae and Triticeae tribes of the Subfamily Pooideae.

The saddle-shaped phytoliths and the bilobate, polylobate, and cross-shaped phytoliths are excellent paleoenvironmental indicators because the three principal prairie types in Kansas are climatically induced (Kuchler 1974). The short grass prairie occurs in the western part of Kansas where the dominant species are Blue grama grass (Bouteloua gracilis) and Buffalo grass (Buchloe dactyloides), both Chloridoideae (Kuchler 1974). The tall grass prairie prevails in eastern Kansas where Big bluestem (Andropogon gerardi), Little bluestem (A. scoparius), Indian grass (Sorghastrum nutans), and Switch Grass (Panicum virgatum), all Panicoideae are the dominant species (Kuchler 1974). Between them lies the mixed prairie with tall, medium tall, and short grasses. The dominant grasses in the mixed prairie are Big bluestem (A. gerardi), Little bluestem (A. scoparius), Sideoats grama (Bouteloua curtipendula), and Blue grama (B. gracilis) (Kuchler 1974). Rainfall in the short grass prairie is about ten to fifteen inches per year. The climate is more humid in the tall grass prairie (Brown 1979). The mixed prairie is very sensitive to major fluctuations of precipitation, oscillating eastward and westward with the alternating intense droughts and wet periods (Kuchler 1974). The Pooideae are adapted to cool and moist climates. Seventy to 85 percent of grass species of Canada and the northwestern United States are Pooideae (Gould and Shaw 1983).

Nine soil samples ranging in depth from 20 to 213 cm below surface were collected from a cutbank with two thick well-defined paleosols in an alluvial terrace on the south shore of Wilson Lake in central Kansas (NE 1/4 of the SE 1/4 of Section 31, Township 12 South, Range 12 West). Surface soil samples

were also collected for modern analogs in the mixed grass prairie adjacent to the subsurface samples (Russell County), and in the Konza tall grass prairie in eastern Kansas (Geary County).

Biosilicates were isolated from 10-gram soil samples using a modified procedure developed by Rovner (1971) based on heavy-liquid flotation (Using zinc bromide mixed to a specific gravity of 2.3) and centrifugation. Phytoliths, sponge spicules, and diatoms were identified using 400X magnification.

Results and Discussion

Biosilicates were analyzed based on a random sample of 100 or more saddle-shaped Chloridoid phytoliths, bilobate, polylobate, and cross-shaped Panicoid type phytoliths, and certain types of trapezoidal-shaped Pooid phytoliths in addition to diatoms and sponge spicules isolated from each sample. The percentages of the various phytolith types, diatoms, and sponge spicules are given in Figure 2. Fundamental and bulliform cells and inner-cores from grass trichomes were common in all 12 samples but were not counted because they are not diagnostic of any tribe or subfamily of grass.

Study of appropriate modern analogs is critical if botanical microfossil data from subsurface samples are to be correctly interpreted. Of the total biosilicates counted in the tall grass modern analog, 52% were saddle-shaped phytoliths diagnostic of short grasses (Chloridoids). In the mixed grass modern analog, where the dominant grass in the immediate area was little bluestem (Andropogon scoparius), a Panicoid, 76% of the total biosilicates were saddle-shaped Chloridoid phytoliths. These figures demonstrate that many of the phytoliths isolated from the modern analogs were blown in from the west and therefore reflect regional vegetation.

The phytolith aridity index, the ratio of Chloridoid phytoliths to total Chloridoid and Panicoid phytoliths multiplied by 100, can be used to identify arid and humid climates in deep sea cores (Twiss 1985). The phytolith aridity index was calculated for each of the 12 samples. The distinct aridity indices for the modern analogs (99 for the short grass prairie, 88 for the mixed grass prairie, and 55 for the tall grass prairie) demonstrates that the aridity index is a reliable method for comparing aridity in different areas of Kansas. The phytolith aridity indices were higher for all subsurface samples relative to the mixed grass prairie modern analog collected adjacent to the subsurface samples demonstrating that the climate in the study area during the time period in which the soils were formed was more arid than at present (Figure 9). The area was still a mixed grass prairie since the relative frequency of saddle-shaped Chloridoid phytoliths, total bilobate, polylobate, and cross-

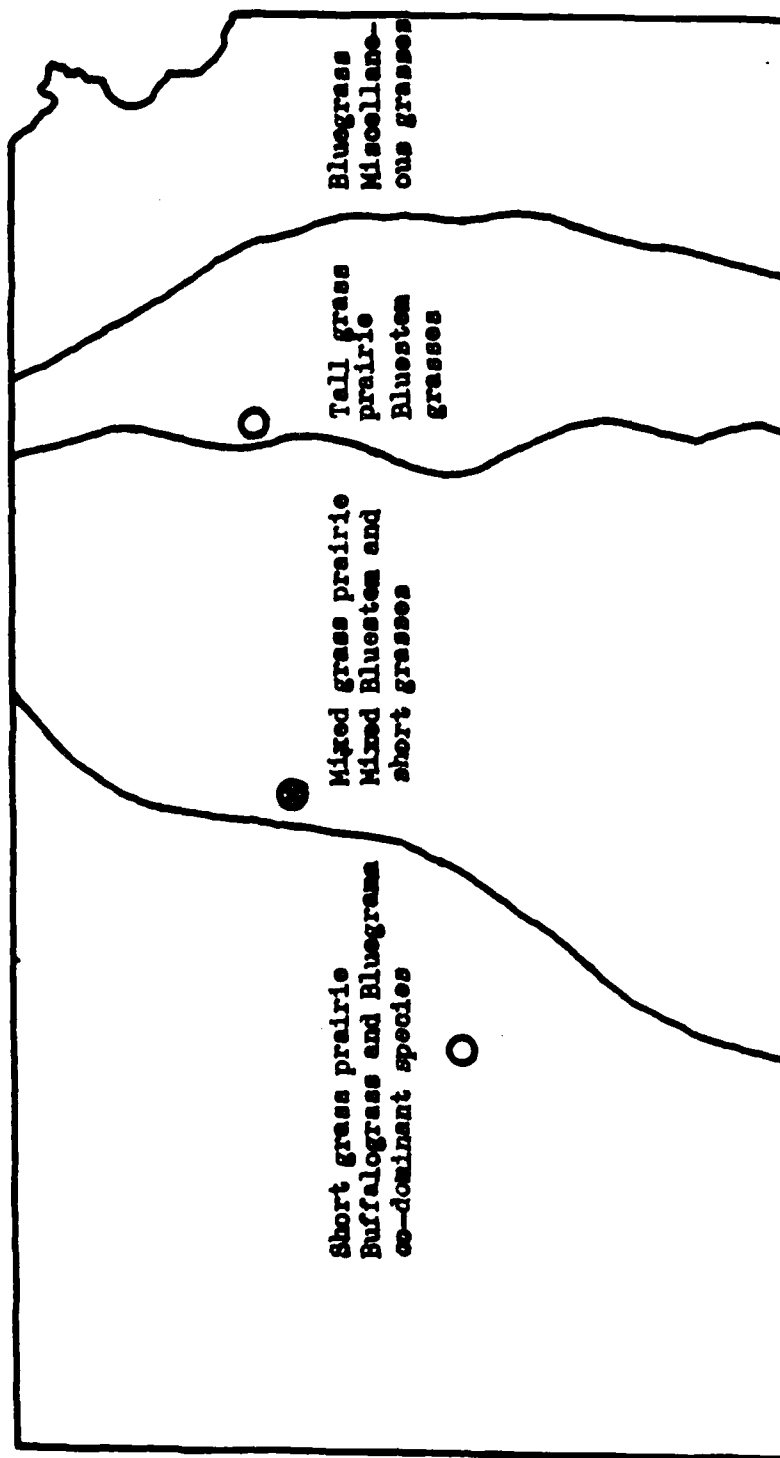


Figure 7. Kansas map outlining four major natural grassland areas (modified from Hyde 1969)

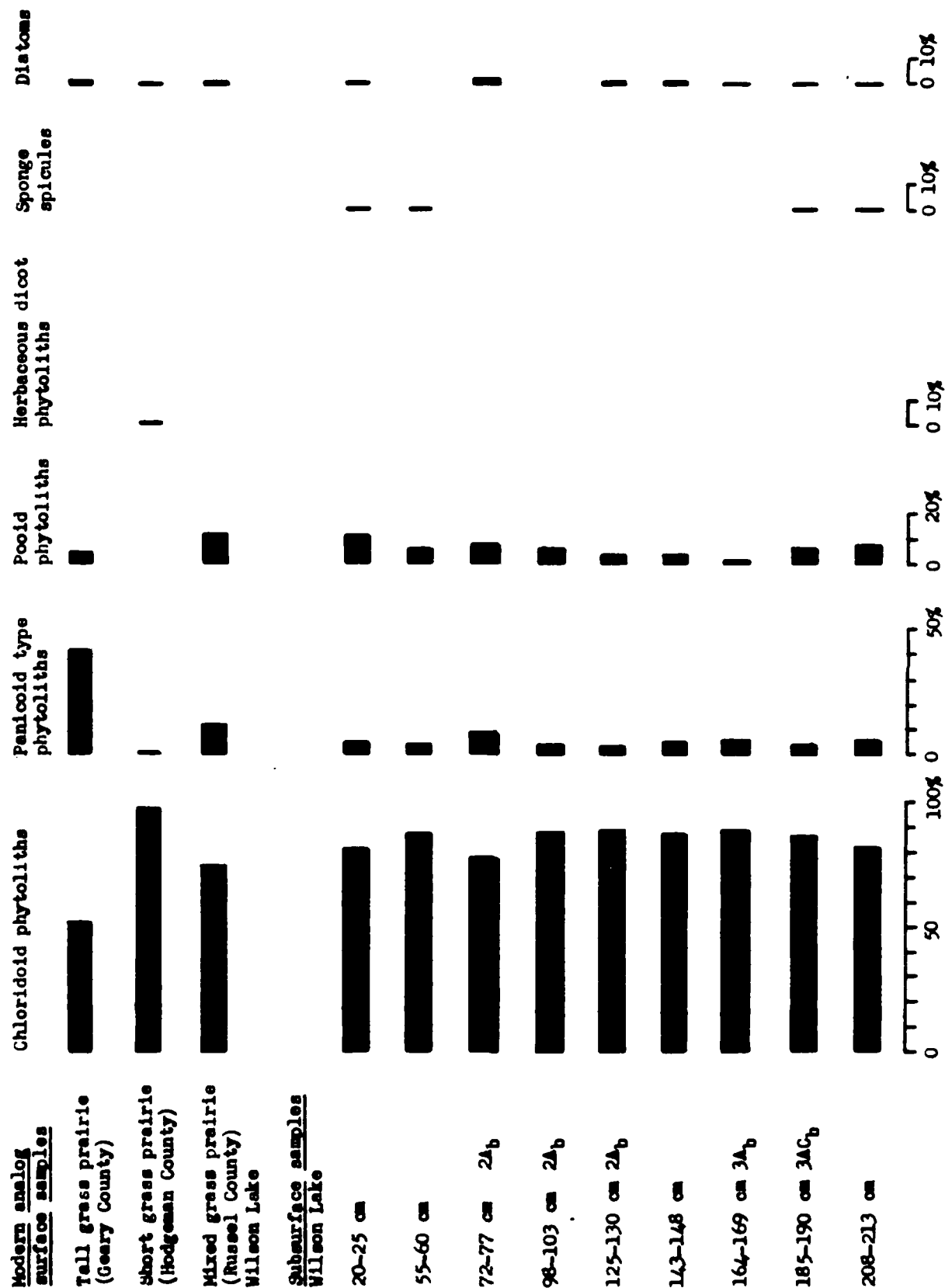


Figure 8. Relative abundance of biosilicates isolated from modern prairie analogs and subsurface samples from Wilson Lake.

Modern analog
surface sample

Tall grass prairie
(Geary County)

Short grass prairie
(Hodgeman County)

Mixed grass prairie
(Russel County)
Wilson Lake

Subsurface samples
Wilson Lake

20-25 cm

55-60 cm

72-77 cm

98-103 cm

125-130 cm

143-148 cm

164-169 cm

185-190 cm

208-213 cm

Increasing
humidity

Increasing
aridity

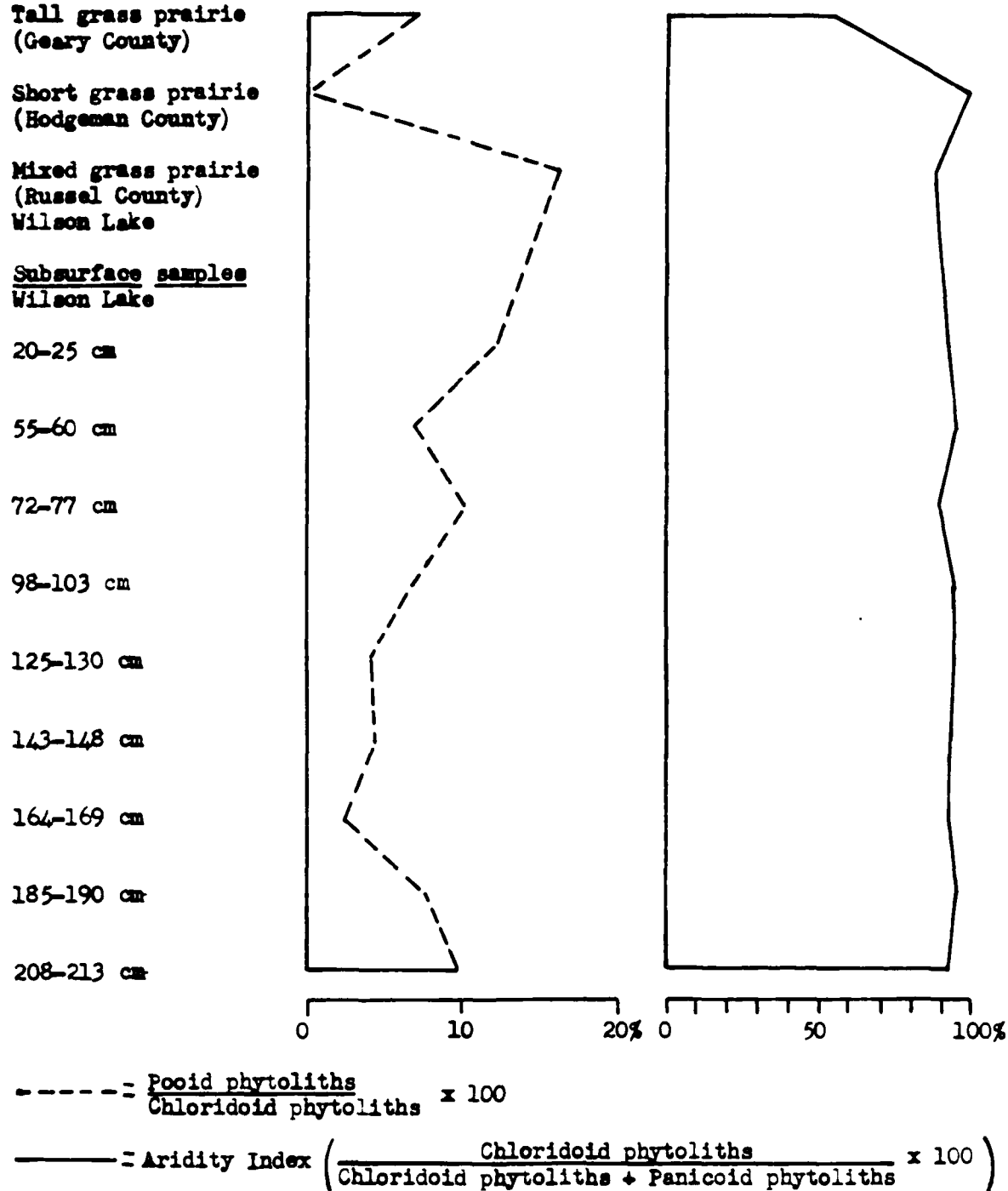


Figure 9. Ratios of Poooid phytoliths to Chloridoid phytoliths x 100 and aridity indices for modern prairie analogs and subsurface samples from Wilson lake.

shaped Panicoid type phytoliths, and trapezoidal Poooid phytoliths more closely resembles the mixed grass modern analog than either the short grass or tall grass analogs.

Brown (1984) reported that fluctuations in the ratios of Poooid phytoliths to Chloridoid phytoliths isolated from stratified deposits may reflect shifts in midsummer temperature. The positive correlation between increasing humidity and higher ratios of Poooid phytoliths to Chloridoid phytoliths and between increasing aridity and lower ratios of Poooid phytoliths to Chloridoid phytoliths in 5 out of 8 subsurface samples (Figure 3) indicates that fluctuations in ratios of these two phytolith types reflect variations in humidity and may not reflect changes in midsummer temperature for these samples. The relative frequency of Poooid phytoliths in the modern analogs may not be representative of the native Poooids because different amounts of phytoliths from wheat, a Poooid, may have been deposited on modern surfaces.

One opaque, perforated platelet was found with the other phytoliths from the short grass analog. This type of phytolith was found to be produced only in certain herbaceous dicots (Bozarth 1985). It may be from western ragweed (Ambrosia psilostachya), one of the more common forbs that produces this phytolith type.

The absence of sponge spicules (either whole or fragmented) from the modern analogs indicates that the presence (1%) of fragmented sponge spicules in the soil samples collected 20-25 cm B.S., 55-60 cm B.S., 185-190 cm B.S., and 208-213 cm B.S. represents overbank deposition of pre-existing alluvium from the Saline River, an aquatic habitat favorable for sponge growth. This means that some of the phytoliths in these samples may have been redeposited since sponge spicules and phytoliths are about the same size. Most of the phytoliths isolated from the other samples from Wilson Lake were probably not fluvially deposited based on the absence of sponge spicules.

The low frequencies of diatoms isolated from 7 of the 9 subsurface samples (no diatoms were found in the other two samples) are typical of prairie biosilicate assemblages based on similar low frequencies of diatoms isolated from the three modern analogs.

Conclusions

Phytoliths, isolated from nine soil samples ranging in depth from 20 to 213 cm below surface, were collected from a cutbank with two thick well-defined paleosols in an alluvial terrace on the south shore of Wilson Lake in central Kansas. Phytoliths were also isolated from modern analog surface samples from the mixed grass prairie at the study site, a short grass prairie in western Kansas (Hodgeman County), and a tall

grass prairie in eastern Kansas (Geary County). Comparison of the phytolith aridity indices calculated for each of the 12 samples demonstrates that the area was more arid than at present during the time in which the soils were formed. Comparison of the relative frequencies of Chloridoid phytoliths, Panicoid type phytoliths, and Pooid phytoliths indicates that the principal vegetation in the Wilson Lake area has been a mixed grass prairie since the alluvium 208-213 cm B.S. was deposited.

Discussion (by Donald J. Blakeslee)

The phytolith record from Wilson Lake is not indicative of any large environmental fluctuations during the period covered by the alluvial deposits. The phytoliths indicate a regime only slightly drier than that of today, and there is some reason to question whether the phytolith pattern reflects a regional climatic shift as opposed to some form of human agency.

Two factors are operative at Wilson Lake that might have made the modern phytolith record slightly different from the prehistoric pattern. One is the suppression of prairie fires by the current inhabitants of the region. In early historic times, severe prairie fires were a frequent occurrence; they may have maintained a floral community somewhat different from that of today.

The other factor that may have affected the modern phytolith assemblage is the presence of Wilson Lake. Lakes have an effect on the local climate by providing a source of moisture and by being a heat sink. Bodies of water change temperature more slowly than does either the air or the land surface, and the result is often a localized fog, mist, or simply a higher humidity. Robert Blasing, who owns land at Tuttle Creek Lake, another man-made lake in Kansas, has noted that the lake has affected the flora on his property. Close to the lake, plants not previously common in the region are now flourishing. At the far side of his property from the water, the original plant community still exists. A similar process at Wilson Lake may have produced the pattern observed by Bozarth--somewhat more tall grasses in the present community than in prehistoric ones.

The geomorphological study corresponds fairly well to the phytolith results (or vice versa). There was alluviation in the Saline River valley prior to 5090 radiocarbon years ago. At that time, reduced alluviation and/or increased moisture led to the development of a soil. The phytolith analysis of this level does not show more tall grasses than today, but as mentioned above, the present regime may be misleading.

Repeated flooding sometime later led to more alluviation, this probably represents another relatively dry climatic regime. Eventually, around 1940 radiocarbon years ago, another

soil formed. In this case, the phytoliths do indicate a moister regime.

The geomorphological information thus indicates some broad climatic shifts in the past. It also helps to explain the absence of old sites at Wilson Lake. The terrace deposits are exposed only at the upper end of the lake, and the soil that formed around 1900 years ago is deeply buried there. A similar pattern is evident in some of the sites recorded before the lake was filled; Early Ceramic sites were deeply buried (up to 3 meters). Earlier sites are not exposed at Wilson Lake, and most of the landforms which contain the buried sites are now inundated.

TABLE 14. PHYTOLITH REFERENCE COLLECTION

MONOCOTS

Gramineae

Species	Subfamily (Tribe)	Complete Aerial Portion	Roots
<u>Aristida purpurea</u> Purple threeawn var. longiseta	Chloridoideae (Aristideae)	+	+
<u>Bouteloua gracilis</u> Blue grama	Chloridoideae (Chlorideae)	+	+
<u>Bouteloua hirsuta</u> Hairy grama	Chloridoideae (Chlorideae)	+	+
<u>Buchloe dactyloides</u> Buffalo grass	Chloridoideae (Chlorideae)	+	+
<u>Eragrostis trichodes</u> Sand lovegrass	Chloridoideae (Eragrosteae)	+	+
<u>Sporobolus asper</u> Tall dropseed	Chloridoideae (Eragrosteae)	+	+
<u>Sporobolus neglectus</u> Puffsheath dropseed	Chloridoideae (Eragrosteae)	+	+
<u>Andropogon gerardi</u> (1) Big bluestem	Panicoideae (Andropogoneae)		+
<u>Andropogon saccharoides</u> Silver bluestem	Panicoideae (Andropogoneae)	+	+
<u>Andropogon scoparius</u> Little bluestem	Panicoideae (Andropogoneae)	+	+
<u>Sorghastrum nutans</u> (2) Indiangrass	Panicoideae (Andropogoneae)		+
<u>Cenchrus longispinus</u> Sandbur	Panicoideae (Paniceae)	+	+
<u>Panicum virgatum</u> Switchgrass	Panicoideae (Paniceae)	+	+
<u>Agropyron smithii</u> Western wheatgrass	Pooideae (Triticeae)	+	+
<u>Elymus canadensis</u> Canada wild rye	Pooideae (Triticeae)	+	+

Table 14. Phytolith Reference Collection (continued)

MONOCOTS			
Gramineae			
Species	Subfamily (Tribe)	Complete Aerial Portion	Roots
<u>Hordeum jubatum</u> Squirrel tail	Pooideae (Triticeae)	+	+
<u>Vulpia octoflora</u> Sixweeks fescue	Pooideae (Poeae)	+	+

Classification by Gould and Shaw (1983).

+ Indicates plant parts processed.

(1) The aerial portion of Andropogon gerardi was studied by processing separate samples of leaves, leaf sheaths, nodes, and internodes.

(2) The aerial portion of Sorghastrum nutans was studied by processing a composite sample of leaves, leaf sheaths, nodes, internodes, rhizomes, and inflorescence.

TABLE 15. PHYTOLITH REFERENCE COLLECTION

MONOCOTS				
Species	Family	Representative Aerial Portion	Pod	Roots
<u>Cyperus erythrorhizos</u> Umbrella sedge	Cyperaceae	+		+
<u>Scirpus pallidus</u> Bulrush	Cyperaceae	+		
<u>Yucca glauca</u> Soapweed	Liliaceae	+	+	
<u>Typha latifolia</u> Cattail	Typhaceae	+		

+ Indicates plant parts processed.

TABLE 16. PHYTOLITH REFERENCE COLLECTION

DICOTS

Herbaceous Species

Species	Family	Representative Aerial Portion	Roots
<u>Amaranthus retroflexus</u> Rough pigweed	Amaranthaceae	+	+
<u>Chenopodium album</u> White goosefoot	Chenopodiaceae	+	+
<u>Artemisia carruthii</u> Sagebrush	Compositae Anthemideae tribe	+	+
<u>Cirsium ochrocentrum</u> Yellowspine thistle	Compositae Cynareae tribe	+	+
<u>Eupatorium perfoliatum</u> Boneset	Compositae Cynareae tribe	+	
<u>Ambrosia artemisiifolia</u> Common Ragweed	Compositae Heliantheae tribe	+	
<u>Ambrosia psilostachya</u> Perennial ragweed	Compositae Heliantheae tribe	+	
<u>Ambrosia trifida</u> Great ragweed	Compositae Heliantheae tribe	+	+
<u>Helianthus annuus</u> Wild sunflower	Compositae Heliantheae tribe	+	+
<u>H. grosseserratus</u> Sawtooth Sunflower	Compositae Heliantheae tribe	+	
<u>H. maximiliani</u> Maximilian's Sunflower	Compositae Heliantheae tribe	+	
<u>Iva annua</u> Sumpweed	Compositae Heliantheae tribe	+	
<u>Silphium laciniatum</u> Compass plant	Compositae Heliantheae tribe	+	
<u>Solidago rigida</u> Stiff-leaved goldenrod	Compositae Heliantheae tribe	+	
<u>Xanthium strumarium</u> Cocklebur	Compositae Heliantheae tribe	+	

TABLE 16. PHYTOLITH REFERENCE COLLECTION (continued)

DICOTS

Herbaceous Species

Species	Family	Representative Aerial Portion	Roots
<u>Psoralea tenuiflora</u> Wild alfalfa	Fabaceae	+	+
<u>Urtica dioica</u> Stinging nettle	Urticaeae	+	

+ Indicates plant parts processed

TABLE 17. PHYTOLITH REFERENCE COLLECTION

DICOTS

Arboreal Species

Species	Family	Leaves	Twig	Bark	Fruit
<u>Acer saccharum</u> Sugar maple	Aceraceae Maple	+			
<u>Quercus alba</u> White oak	Fagaceae Beech	+	+		+
<u>Quercus palustris</u> Pin oak	Fagaceae Beech	+			
<u>Carya glabra</u> Pignut hickory	Juglandaceae Walnut	+			
<u>Juglans nigra</u> Black walnut	Juglandaceae Walnut	+			+
<u>Gleditsia triacanthos</u> Honeylocust	Leguminosae Legume	+			+
<u>Cercis canadensis</u> Eastern redbud	Leguminosae Legume	+			+
<u>Platanus occidentalis</u> Sycamore	Platanaceae Sycamore	+	+	+	
<u>Populus deltoides</u> Eastern cottonwood	Salicaceae Willow	+	+		

TABLE 17. PHYTOLITH REFERENCE COLLECTION (continued)

DICOTS

Arboreal Species

Species	Family	Leaves	Twig	Bark	Fruit
<u>Salix discolor</u> Pussy willow	Salicaceae Willow	+			
<u>Celtis occidentalis</u> Hackberry	Ulmaceae Elm	+			+
<u>Ulmus americana</u> American elm	Ulmaceae Elm	+	+		

+ Indicates plant parts processed

TABLE 18. PHYTOLITH REFERENCE COLLECTION

GYMNOSPERMS

Species	Family	Cones	Twig with Needles
<u>Juniperus communis</u> Common juniper	Cupressaceae Cypress		+
<u>Juniperus virginiana</u> Eastern redcedar	Cupressaceae Cypress		+
<u>Picea englemannii</u> Englemann spruce	Pinaceae Pine	+	+
<u>Pinus aristata</u> Bristlecone pine	Pinaceae Pine		+
<u>Pinus contorta</u> Lodgepole pine	Pinaceae Pine	+	+
<u>Pinus ponderosa</u> Ponderosa pine	Pinaceae Pine		+
<u>Pinus strobus</u> Eastern white pine	Pinaceae Pine		+
<u>Pseudotsuga menziesii</u> Douglas-fir	Pinaceae Pine	+	+
<u>Taxodium distichum</u> Baldcypress	Taxodiaceae Redwood		+

EQUISETALE

Species	Family	Representative Aerial Portion
<u>Equisetum hypmale</u> Horsetail	Equisetaceae	+

+ Indicates plant parts processed.

VI.

RESULTS: THE CULTURAL LANDSCAPE

The Pawnee Trail

Introduction

Before the opening of the Santa Fe trail in 1821, the most important route across the Plains to the Southwest followed a different course. There was an Indian trail that led from the Grand Island on the Platte River in Nebraska along a southwesterly course to the Great Bend of the Arkansas River. From there, one could take several different routes to Pecos or Taos.

Actually, there were two main branches of the trail that ran in parallel tracks across the north-central part of Kansas (Fig. 10). The westernmost and most often used (herein called the main branch) ran south from Guide Rock on the Republican River in Nebraska, past Waconda Spring on the Solomon River, across the headwaters of Spillman Creek, southwest across Wolf Creek to a crossing of the Saline River a short distance above Wilson Lake dam. On the south side of the river, several canyons provided access to the upland trail that ran across the Smoky Hill River at the mouth of Beaver Creek, up the west side of that stream, and down the west side of Cheyenne bottoms to the Great Bend of the Arkansas River.

I have named the eastern route the Mead branch after J.R. Mead, who documented its location, use by the Pawnee, and the location of some archeological sites associated with it. This branch probably left the other in the vicinity of Dorrance, south of present Wilson Lake. From there, it ran east past Hell Creek canyon, then northeast to a crossing of the Saline River upstream from the town of Vesper. It then crossed Spillman Creek near Denmark, Salt Creek near its fork, and the Solomon at Solomon Rapids. From there it continued north to the southerly bend of White Rock Creek, then downstream to the Republican Pawnee village that was its reason for existence.

A third north-south Pawnee trail existed west of the pair discussed here. Its existence was documented by Morse in 1820 and Ashley in 1824 (Ashley and Smith 1918; Morse 1822). Hyde (1971: 120-121) shows the location of the upper end of the trail, at Plum Point, west of the present town of Kearney, Nebraska. Judging from the topographic maps of the region, it is likely that this trail led to the quarries of brown Smoky Hill jasper near Norton, Kansas. This material was used primarily by the Skiri band of the Pawnee, and Holen (1983:

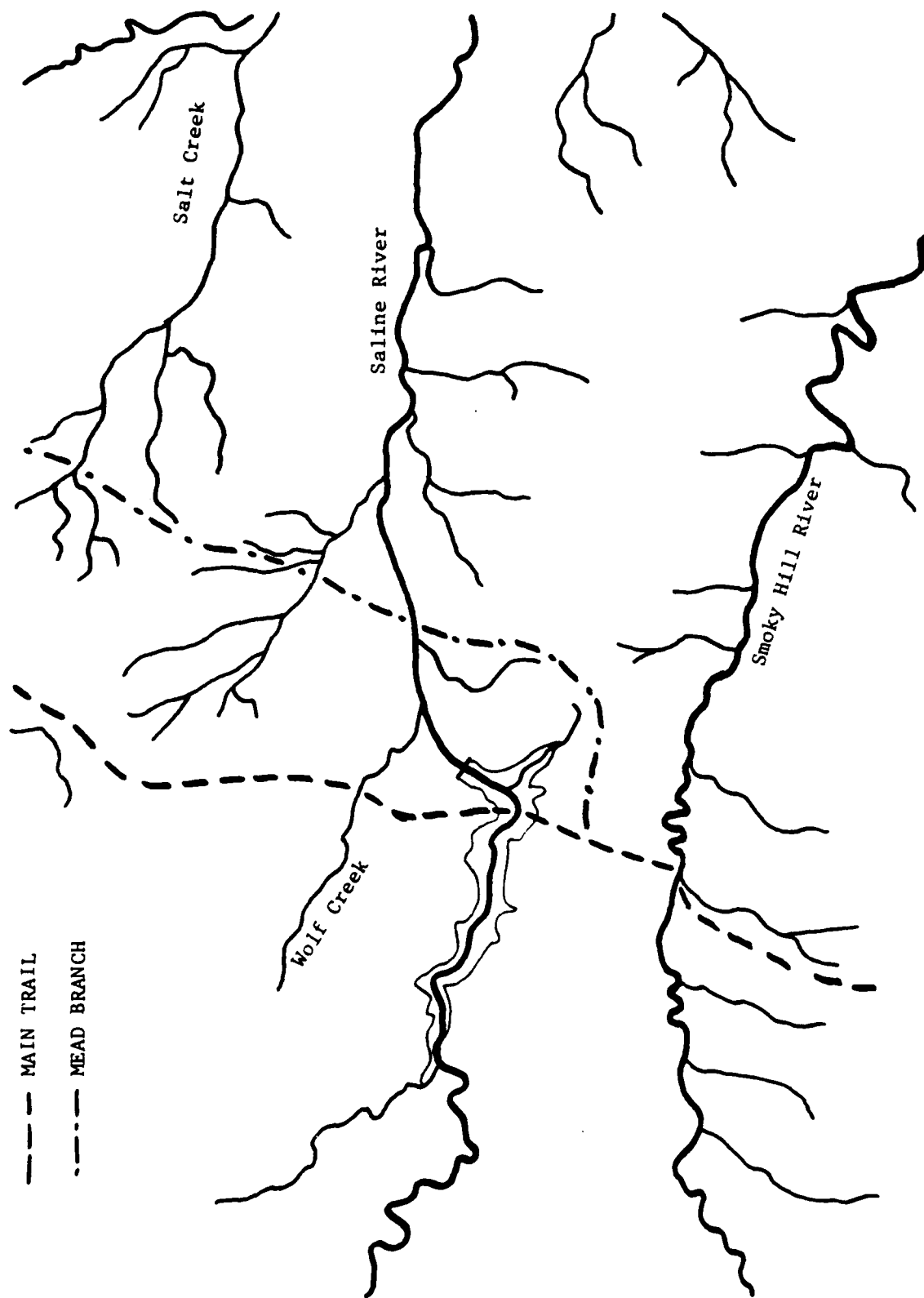


FIGURE 10. INDIAN TRAILS IN THE VICINITY OF WILSON LAKE, KANSAS

104-105) in effect proposes that they used this trail during the part of their seasonal round, gearing up for the bison hunt by visiting the quarries. I have found no records of use of this trail by trappers and explorers, while the two branches of the main Pawnee trail appear to have been in almost constant use.

In the following sections, I document the use of the two branches of the Pawnee trail by various early travellers. The accounts that follow trace the movements of a few other early travellers to Santa Fe as well. This is done in order to place the number of travellers on the Pawnee Trail in proper perspective; the trail absolutely dominates travel to and from Santa Fe in the years before 1821, when William Becknell initiated the route that became known as the Santa Fe trail. In those cases where knowledge of the trail makes it possible, I also correct previous estimates of the routes of the travellers, and provide maps of the correct routes.

Pedro de Villasur, 1720

Near the beginning of the 18th century, word of Frenchmen advancing across the Plains began to reach the Spanish frontier. At first, in 1695 and 1696, there were only second hand accounts brought by Apaches. In 1698, however, there was a report of concrete evidence in the form of loot taken from the Pawnee by raiding Navajos. It is said to have included carbines, cannon, powder flasks, brass pots, shoes, and the like (Thomas 1935: 13-14). The inclusion of cannon in the list, however, makes it likely that the report was highly exaggerated, if not entirely fictional. In 1698, official French expeditions and French posts were very distant from the Pawnee. Radisson reached the western edge of the Great Lakes only in 1660 (Adams 1861), Marquette and Jolliet explored the Mississippi River in 1673, and Robert Cavelier de La Salle attempted to colonize the Gulf coast in 1687 (Parkman 1956). The French expansion onto the Plains did not begin until the 18th century, with Bourgmont's expedition to the mouth of the Platte in 1714, La Harpe's journey to Oklahoma in 1717 (Wedel 1981: 26-30), and Du Tisne's visit to Wichita also in 1717 (Wedel 1981: 25-26). An occasional voyageur may have visited the Pawnee before 1700, but it is unlikely that such people were toting cannons.

More second hand reports of Frenchmen somewhere to the east came in 1702. Then, in 1706, the Cuartelejo Apaches invited Ulibarri to join them in a raid against the Pawnee and French. In addition, they told a story of having killed a Frenchman and a Frenchwoman. This was probably another tall tale or a misunderstanding, as the Apaches later claimed only that they killed a Pawnee chief (Thomas 1935: 19-20).

In 1719, Governor Valverde of New Mexico led an expedition against the Comanche with orders to reconnoiter the French at the same time. He had no luck in running down the Comanches but did garner some information about the French. When he was on the Arkansas River near the Colorado-Kansas border, his expedition was visited by Cuartelejo, Paloma and Calchofines Apaches. Among them was a Paloma Apache with a gunshot wound. This man reported that he received the wound from the Kansa who were allied with some whites. Valverde concluded that the latter must be French. The Apaches also reported two French-Pawnee settlements, each as large as Taos, on a very large river. Valverde called it the Rio Jesus Maria, which in later reports was a name given to the Platte (Thomas 1935: 143-144).

The following year, Valverde sent his second in command, Lieutenant-General of the Kingdom Don Pedro de Villasur, against the French. By this time, Spain was at war with France and England, making knowledge of French positions and strength essential. The result of the foray was, however, a terrible setback to the Spanish colony.

Villasur left Santa Fe on June 16, 1720, with 106 men: 42 soldiers, 3 settlers, 60 Indian allies, and a priest. He took with him maize, short swords, knives, sombreros, and half a mule load of tobacco. His own personal baggage included silver tableware and writing equipment (Thomas 1935: 36-37). By the route discussed below, he reached the Platte River near Grand Island, Nebraska. Crossing that stream, he marched to the Loup River, where he encountered the Pawnee and Oto. There, at dawn on August 13, 1720, the Indians attacked and killed Villasur and most of his men. Thirty-five of the 46 Spaniards died in the assault, along with 11 of their Indian allies.

A variety of primary documents provide a unique view of the massacre. There are two eyewitness accounts by Spanish survivors who were questioned in Santa Fe (Thomas 1935: 226-230), a fragment of the official diary of the expedition, and an Indian painting, on skin, of the battle (Hotz 1970). The whole record makes it clear that no French soldiers were involved, but this is how the Spaniards explained the defeat.

In contrast to the abundant evidence regarding the battle, little remains that documents the route that Villasur followed. We have information regarding only the starting point (Santa Fe), a spot visited en route (El Cuartelejo), the ford across the Platte, and the battle site on the Loup River. There is just enough, however, to demonstrate that he used the Pawnee Trail for the last leg of the trip and to argue plausible routes for the other parts of the journey.

Critical to any reconstruction is the identity of El Cuartelejo. This is the Apache settlement from which came many of the Indians who visited Valverde on the Arkansas River in 1719. Most scholars agree that it is the spot now known as the Scott County Pueblo, on Ladder Creek in western Kansas. A

prominent opponent of this view, however, is the historian A. B. Thomas (1924; 1935: 271) who places El Cuartelejo in eastern Colorado. This is clearly in error, as Shine argued as early as 1924. More recent attempts that trace the day-to-day movements of the various Spanish expeditions from Santa Fe (Shroeder n.d.; Gunnerson 1984) show beyond a shadow of a doubt that El Cuartelejo is the Scott County Pueblo on Ladder Creek. Indeed, in tracing these expeditions between known landmarks, Gunnerson concluded that the magnetic declination in the region must have been about 12 degrees East of North. This is the same declination that Bolton (1949) independently derived for the Coronado expedition of 1541, a figure that has been verified by recent archeomagnetic measurements (Jeff Eighmy, personal communication). That there might be so large an error in compass readings was not considered by Thomas when he located El Cuartelejo in eastern Colorado. If one puts a protractor on a map centered on Santa Fe, however, a 12 degree angle is roughly the difference in direction of travel between Santa Fe and the Scott County Pueblo, on the one hand, and Thomas' location for El Cuartelejo on the other.

It is likely that Villasur initially followed the route taken by Valverde in 1719, as some of his men had been on that expedition. Once beyond the mountains, however, it is likely that he switched to the more direct route used by Ulibarri in 1706, when he went to El Cuartelejo. This compound route fits well with the estimate made in the journal of the expedition that they had travelled about 300 leagues from Santa Fe to reach the Platte River (Shine 1924: 85). The likely route is shown in Figure 11).

For the route that Villasur followed from El Cuartelejo to the Platte River in central Nebraska, we have no direct information. An important clue is provided, however, by the surviving page of the expedition journal. This document was obtained by the French commander at Kaskaskia from the Indians shortly after the massacre. The rest of the journal never came to light. The page that survives begins on August 6, 1720, with the expedition following an Indian trail to a ford of the Platte River. The trail in question, judging from the later movements of the expedition, must be the main branch of the Pawnee Trail.

If the expedition was following the Pawnee Trail at this point, where did they get on it, and along what route did they march from El Cuartelejo to the Pawnee Trail? Even more important, how did they know how to find it? In the absence of direct evidence, the answers to all of these questions must remain speculative.

The most likely route for Villasur to have followed from El Cuartelejo to the Pawnee Trail would have been for him to have followed the Ladder Creek canyon north to the Smoky Hill River. On the north side of the Smoky Hill valley was an east-west Indian Trail that later became the Smoky Hill Trail used

ROUTE OF THE VILLASUR
EXPEDITION, 1720

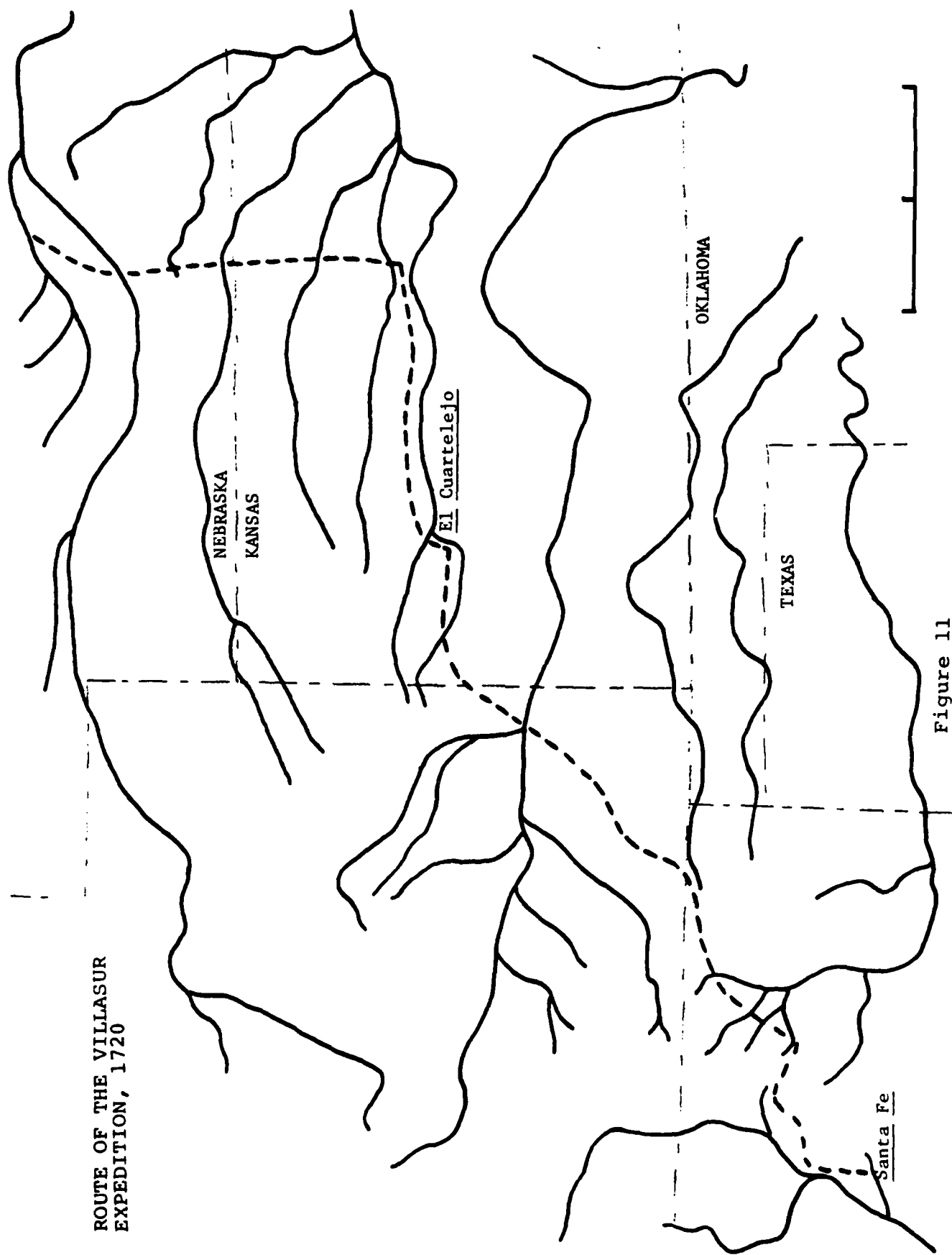


Figure 11

in the Colorado gold rush of 1859. Turning east on this trail, Villasur would have reached the main branch of the Pawnee Trail just south of Wilson Lake. Following the Pawnee Trail north, he would have arrived at the point described in the expedition journal.

How the Spaniards were guided along this route remains speculative. The most likely source of knowledge about the trails is among the Indian allies who accompanied the expedition. It may have been one of the 60 Pueblo Indians who were with the army when it left New Mexico or perhaps a Cuartelejo Apache who joined the expedition on Ladder Creek. Since several records cited above document Apache-Pawnee warfare prior to 1720, it is very likely that the Apaches were familiar with the route to the Loup River Pawnee villages. That at least some residents of the Pueblo were also cognizant of routes across the Plains as early as 1541 is demonstrated by the records of the Coronado expedition. Similarly, Verendrye (Burpee 1927: 367) provides evidence of a Spanish-speaking Indian who visited the Mandan villages in North Dakota in 1738! Therefore, since it is clear that Villasur would have had guides familiar with the trails in the Central Plains, it seems safe to infer that he made use of them.

Etienne Veniard de Bourgmont, 1724

Etienne Veniard de Bourgmont was a frontier adventurer who was able to provide invaluable service to France because of his experience gained in living with various Indian tribes. It was service that was sorely needed. Nasatir (1952 I: 12-22) provides a good sketch of the political situation facing the French in the first part of the eighteenth century. Having found it difficult to limit Spanish power by ascending the Red River toward New Mexico, they were also stymied in any northwesterly approach across the plains by inter-tribal hostilities. Particularly troublesome was warfare between their easterly Indian allies, such as the Kansa and Osage, and the Padouca who occupied the land between them and New Mexico.

People in Louisiana who were familiar with frontier problems and personalities proposed sending Bourgmont to cement a peace among the Indians. Formerly stationed at Detroit, Bourgmont had twice lived among Indians--the second time with the Missouri tribe, in which he had a wife. In 1714, he had written the clearest description of the Missouri River country available to the French, and he apparently had ascended the river as far as the mouth of the Platte.

Bourgmont was therefore dispatched from France as the best person available to impress the local tribes with French power and to impose a Pax Francais on the southern plains. In 1723, he established Fort Orleans at the mouth of the Grand River in Missouri, and in 1724 he proceeded to make a treaty between the

Kansa and Osage on the one hand and the Padouca on the other.

The identity of the groups called Padouca by the French and others has been discussed above. In the discussion that follows, I side with Wedel (1959) in identifying Bourgmont's Padouca as Plains Apaches. The context of the situation in terms of French-Spanish competition in the wake of the Villasur disaster certainly supports the idea that they were Apaches.

The Apaches are a direct connection between the Villasur and Bourgmont expeditions. In 1720, the Spanish regime promised the Apaches that they would build a fort in Apache territory; el Cuartelejo was one proposed location. The Apaches were increasingly hard pressed by a variety of enemies. From the northwest, the Comanches raided them in increasing numbers. To the east, the Pawnee and Wichita, armed with French-supplied guns, were also a growing threat.

The Villasur expedition, however, ended in disaster, and after four years, the promised Spanish fort had not materialized. Little wonder, then, that the Apaches responded favorably to Bourgmont's offer of an alliance with the French and the Siouan-speaking tribes of the eastern Plains border. The Kansa and Osage were better armed with guns than the Pawnee and Wichita; in time the French might supply some directly to the Apaches. It was an offer they could not refuse.

In preparation for this task, Bourgmont purchased Padouca slaves to return to their homeland, and brought an impressive number of goods as presents. He went first to a Kansa village located in northeastern Kansas, near the present town of Doniphan (Wedel 1959: 30). From there, he left overland for the Padouca settlement, accompanied by his ten year old son by his Missouri wife, 7 Missouris, 5 Kansas, 4 Otoes, 3 Ioways, and 14 other Frenchmen. Ten horses carried gifts for the Padoucas.

The party travelled three and one half days to a crossing of the Kansas River. Wedel (1959:30) places it at Rocky Ford, near the present day town of Rossville, upstream from Topeka. Bourgmont estimated that they covered 20 leagues in the first three days. If they continued to travel at the same rate on the fourth day, they would have covered 23 of Bourgmont's leagues in 3.5 days.

The length of the league used as a unit of measure by early travellers generally was between 2.5 and 3 miles, with each traveller having a tendency to under- or over-estimate the distance travelled. Whenever possible, it is worthwhile to check an individual traveller's "league" by measuring the actual distance travelled between two known points. The distance from the Kansa village to the ford, by the probable route of the trail is 69 miles, which yields 3.0 miles per league. It also yields an average distance per day of 20 miles, normal for expeditions of this sort.

Bourgmont also estimated that the ford was 20 leagues from the mouth of the Kansas River. The actual straight line distance is 75 miles, giving another estimate, of 3.7 miles, for Bourgmont's league. Since he did not actually travel this part of the river, however, the previous estimate of 3 miles per league should be preferred. What is clear is that Bourgmont's "leagues" tend to be at the upper end of the range of variation for the period.

From the ford, Bourgmont's account has the party travelling generally WSW and then SW another 48 leagues, or 144 miles by the estimator devised above. The route, at least initially would have been along the Indian trail recorded by Blasing (1985) that ran WSW up the west side of the Mill Creek drainage. This trail intersects another, called the Kansa Trail, that trends to the southwest to what Pike labelled the Kansa crossing of the Arkansas River. The trail intersects others, however, and Bourgmont could have ended up in several spots. One is on the Saline River near or at Wilson Lake; this would have involved crossing the Smoky Hill River. Another is Rattlesnake Creek, which would have entailed fording the Arkansas River. Both fit his description of a stream of brackish water, and both are about 150 miles by Indian trails from Rocky Ford.

Bourgmont wrote that the "Grand Village of the Padouca" contained some 500 lodges, 800 warriors, 1500 women, and more than 2000 children. These people had some horses and a huge number of dogs. This description is somewhat problematic. Not only are there no Dismal River Aspect sites (the archeological remains of the Plains Apaches) this far northeast, but also there are no Dismal River sites anywhere large enough to have been home to 4300 people. Evidently, the "Grand Village" described by Bourgmont was a rendezvous of all of the Apache bands from a wide region. It is likely that it included representatives of all of the major Plains Apache groups -- Jicarillas, Cuarteles, Palomas and Calchufines. The rendezvous was also probably situated well to the east of the normal Apache territory in order to meet the French, Kansa, Osage, Missouri and Ioway emissaries.

What the available portions of Bourgmont's journal make clear is that he travelled with a large number of Indians to guide him, and there is no hint that they did not know exactly where they were going and how to get there. They travelled southwest from the Kansa village to a good ford across the Kansas River and then up the south side of that stream toward their destination. Until the full Bourgmont journal is properly analyzed, however, including the names of the creeks that Margry omitted from his version of the journal, we cannot say how close to Wilson Lake the Padouca encampment really lay.

The Mallet Brothers, 1739

In the year 1739, there occurred the first recorded trip by Frenchmen from their colony to Spanish Santa Fe. It was accomplished, however, by a most roundabout route -- one that definitely involved the Pawnee trail.

The records of this expedition leave much to be desired. The Mallet brothers apparently kept a journal of their trip, but this was surrendered to the governor of Louisiana on their return. He made an abstract of the journal, which he sent to France. This was published, with errors and omissions (Mildred Wedel, personal communication) by Margry and was translated by Folmer (1939). The discussion below is based on our own translation of a fair copy of the abstract that is housed in the National Archives.

Believing that Santa Fe lay near the headwaters of the Missouri, Paul and Peter Mallet, with six men, ascended that river. Eventually they reached the Arikara in South Dakota, but the account of their journey does not begin there. The abstract refers instead to a Panimaha village at the mouth of the Panimaha River, placing the latter 60 leagues (156 miles) above the Oto, 160 leagues (416 miles) above the Kansa, and 240 leagues (664 miles) above the mouth of the Missouri River. Folmer (1939: 164) identified the Panimaha River as the Niobrara and accepts the presence of a Skiri (Panimaha) village there. Neither is correct.

There are several problems with identifying the Niobrara as the site of a Skiri village. First, the name of the river, the "Panimaha," is not applied to the Niobrara by any other source. The Platte, on the other hand, had been called the "River of the Panis" by Bourgmont in 1724 (Folmer 1939: 283). The Mallet Brothers called the Platte River by its current name when they first reached it somewhere near Omaha. This appears to be a translation of the Pawnee word for the stream (Hyde 1951:353). The name of today's Loup River, however, is an equivalent of Panimaha, since Panimaha was a Siouan term for the Skiri band of the Pawnee, and Skiri means wolf, or loup in French (Panimaha = Skiri = Wolf = Loup). The Mallet brothers, however, appear to have called the Loup the "Padouca River" at one point in their journal; this appellation that is discussed below.

Another reason for suspecting that there was no Skiri village on the Niobrara is the evidence that suggests that other groups controlled the region. In 1717, Bourgmont described the Ioway as being on the left bank as one ascends the river--probably a reference to a village on Aowa Creek in Dixon County (Ludwickson et al. 1981: 43, 66). He places the Mahas (Omaha) on the White River (Ibid: 67). Later, the Omaha moved south. This had happened by 1723, when Renaudiere described the Omaha as living 90 leagues above the mouth of the Platte River, i.e., in the vicinity of Bow Creek (Ludwickson et

al. 1981: 71-72). Governor Bienville wrote in 1734 that he had learned that some (or all) of the Panimahas had "gone to the Ricaras who inhabit the upper part of this same [Missouri] river" (Nasatir 1952 I: 25).

Thus there may have been an Arikara village on the Upper Missouri in which some Skiri Pawnees resided. This sort of arrangement was common in later years (Troike 1964; Wood 1955). Other Skiri may have been living at the same time in central Nebraska, where all other reports place them before and after 1739. Certainly this would help make sense of some of the distances reported in the abstract. It asserts that the Mallet expedition ascended the Missouri River until they encountered the Ricaras (Arikara) more than 150 leagues from the "Panis". By Folmer's interpretation, the Arikara would have to be about 375 miles above the Niobrara, but this would put them in the vicinity of the Knife River villages of the Mandan and Hidatsa in North Dakota. All other accounts, however, place the Arikara in South Dakota, about 375 miles by the route later taken by the Mallet brothers from the Pawnee villages in central Nebraska.

The likeliest reason for the abstract of the journal having the Mallet brothers leaving from a Panimaha village on the Upper Missouri is that Governor Bienville confused two similar tribal names. The French called the Omaha the "Maha" and they termed the Skiri Pawnee the "Panimaha." In 1785, the governor of Spanish Louisiana, Estevan Miro', did confuse the two names (Nasatir 1952 I: 126). To make matters worse, the Omaha and Skiri were on friendly terms, and it would not have been surprising if the Mallet brothers had mentioned some Panimahas in a Maha village as well as some in the Arikara village. Thus Bienville may have confused a Maha (Omaha) village on the Maha River (Bow Creek) with a Panimaha (Skiri) village on the Panimaha (Loup) River.

If this were the case, it would help interpretation of the abstract of the Mallet journal in two respects. One is the curious lack in it of any reference to the Omaha (Ludwickson, personal communication). The abstract gives distances in leagues from the Illinois country to the villages of the Missouri, Kansa, Oto, Skiri and Arikara. The route of travel on the initial leg of the journey, by boat up the Missouri River, would have taken the party directly past the Omaha village. At the time, they were living in their famed "bad village," located near the mouth of Bow Creek in Cedar County, Nebraska. Later travellers up the river had a difficult time getting past the Omaha. The lack of any mention of this village in the Mallet abstract is thus difficult to explain unless the "Panimaha" were in fact the Omaha.

Making this equation also helps to pinpoint the spot where the overland trip to Santa Fe began. The stream on which the Omaha village was situated is now called Bow Creek, after Little Bow, an Omaha chief who lived in the village. To some,

however, it was Omaha Creek, i.e., Maha River (Ludwickson et al. 1981: 74-75).

Starting the account of the Mallet expedition at the mouth of Bow Creek rather than at the mouth of the Niobrara improves the consistency of some of the distances reported. As discussed below, the travellers took five days to travel from the village in question to the Platte River. If they began at the Niobrara River, they would have travelled about 32 miles per day, an unusually high figure. If they left from the mouth of Bow Creek, however, the daily travel would be 23 miles per day -- a far more reasonable figure.

Thus, after visiting the Arikara in South Dakota, the little expedition returned downstream to the Omaha village where the wanderers were finally put on the road to Santa Fe. They left the village at the mouth of Bow Creek on May 29, 1739, going by land with horses that must have been obtained from the Indians. The route pointed out to them paralleled the Missouri River. It consisted of a trail that ran along the crest of the divide between the waters of the Platte and the Missouri rivers. This trail is documented in the General Land Office Survey Notes for Dixon County, Nebraska.

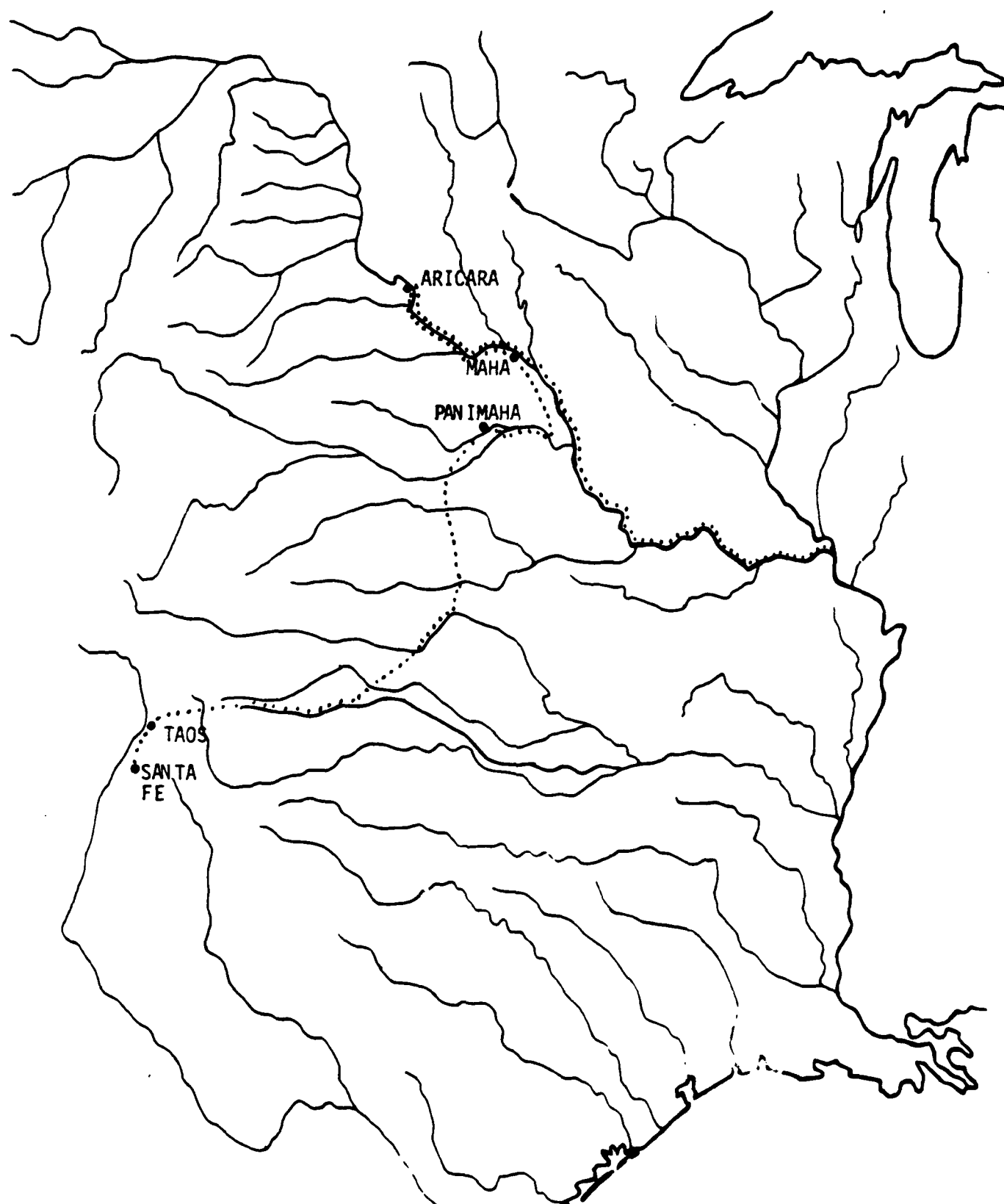
They reached the Platte River near Ashland and ascended the left (north) bank for 28 leagues. Here they encountered the Padouca (Loup) River. Three days later, they crossed the Platte. No mention is made of passing the Pawnee villages in this region, but the dates given suggest that they stopped in one or more of them. It took them only from May 29 to June 2 to go from the mouth of Bow Creek to the Platte, giving a rate of travel of 23 miles per day. From there they reached the crossing of the Platte in 11 days, of which only three were spent above the Loup. This leaves eight to nine days to travel 28 leagues, roughly 70 miles or about 8 miles per day. The much slower rate of travel probably represents a visit to the Pawnee villages. The fact that they had an Indian name for the Loup River also suggests the presence of a guide or guides (although the guide could have been a Frenchman who had been through the area previously).

The name given for the Loup at this point in the abstract -- the Padouca River -- is not particularly troublesome. Plains Indians often named streams for the tribes that one could reach by travelling along them. On the upper reaches of the Loup River were one or more Padouca settlements. Hyde (1951) labels the north fork of the Loup the Padouca River, but the other Padouca sites were high on the middle fork, at the fork of the Dismal River. Regardless, there was good reason for the Loup River to be called the Padouca River.

Three days' travel from the Skiri village on the Loup River would have put them in the vicinity of Grand Island. After crossing the Platte, they spent the night of the 14th of June on the far side of what they call the Costes (or Hills)

Figure 12

ROUTE OF THE MALLET BROTHERS, 1739



River, which is described as flowing into the Platte. There is no such stream anywhere along the section of the Platte above the Loup River. Folmer (1939: 165) suggests that they were on the Big Blue River and were mistaken about where it flowed. The Little Blue River, 25 miles south of Grand Island, is a far better choice. The Fremont map (see below) documents the crossing of this stream by the Pawnee trail and shows the northeasterly trend of the stream at the ford that confused the Mallet brothers about the river into which it fed. It is reached via the trail across a high divide. Hence the name, Costes River.

On the 17th they crossed another river, one that they called the White Hills River. The route to it was across a treeless plain. The description would fit any trail along an upland ridge. Other streams were crossed on the 18th (Amiable), 19th (Soucis), 20th (Kans), 22nd (a la Fleche), 23rd, 24th 26th, 27th, 28th, 29th, and 30th (all unnamed). The stream crossed on the 30th had stones on its bank with "Spanish inscriptions."

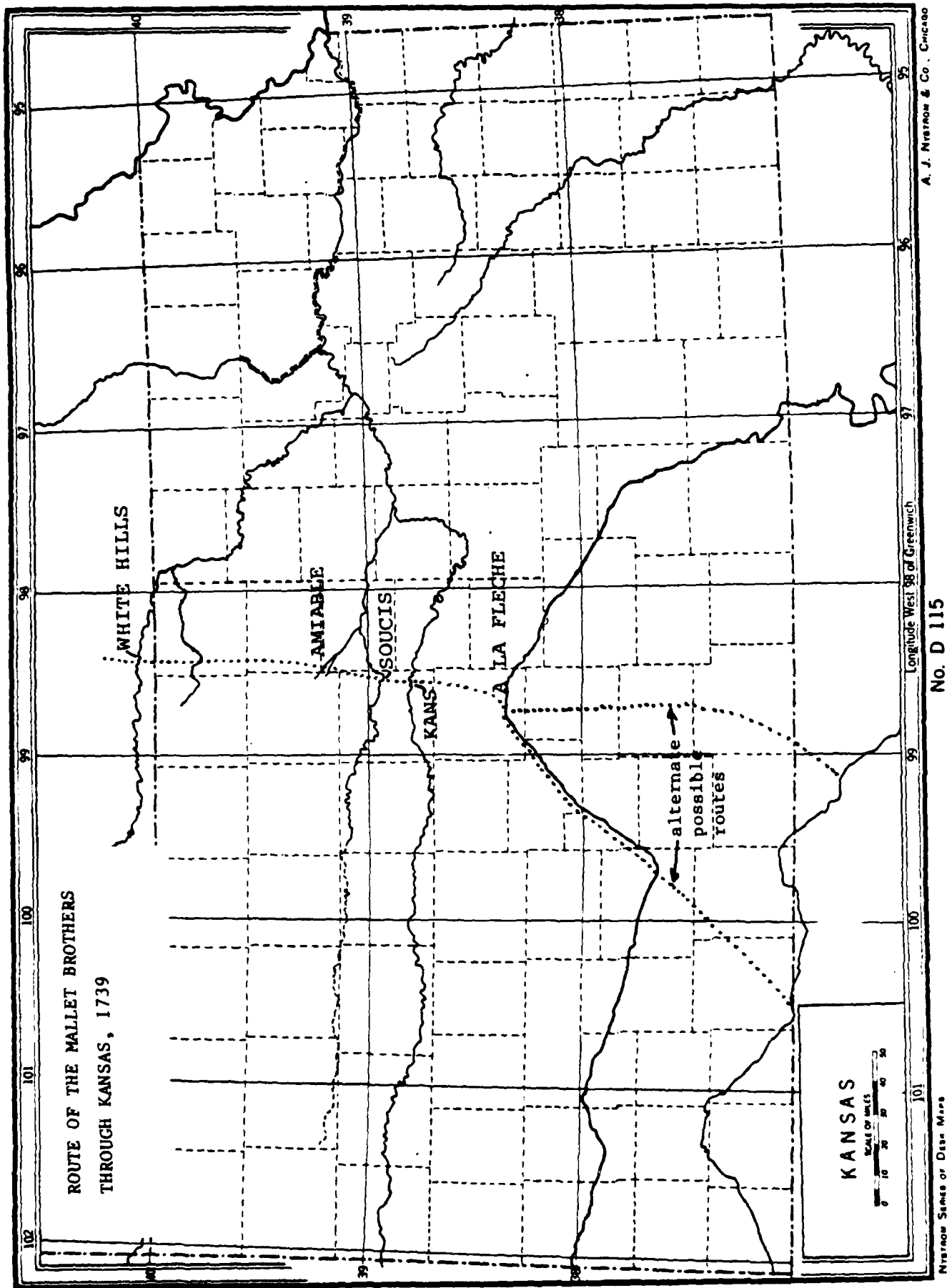
Identifying all of these streams with modern equivalents is not difficult when one knows the location of the trail. In later times, the Smoky Hill River was sometimes called the Kansas because it is the main branch of that river, and a two-day journey from it would place the Mallet brothers on the Arkansas. Why they called it "a la Fleche" (of the arrow) is of considerable interest. According to Ben Clark (n.d.), all the Southern Plains Indians called the Arkansas the "Flint River." It is likely that there is a relationship between the Arrow River and the Flint River. The Pawnee have a single word, tahu:ru, that glosses 'meteorite, flint, scalp, projectile, projectile point' (Parks in Chamberlain 1982:245). Thus it is quite possible that they were reporting a Pawnee name for this river.

Counting backwards from the Kansas River, the "Soucis" would be the Saline River, the "Amiable" Spillman Creek, and the "White Hills" River could be the Solomon, White Rock Creek, or the Republican. Apparently, the Mallet brothers recorded only the names of the streams on which they camped, as their list is too short for the number of streams they must have crossed between leaving the Platte and reaching the Smoky Hill.

The origin of the name, "Soucis", for the Saline River may derive from the enormous number of rattlesnakes found there; Murray reported the largest concentration of serpents that he had ever seen there in 1835 (Murray 1839).

The streams passed on a daily basis after the "River of the Arrow" are difficult to identify if one assumes, as Folmer did, that they did not reach the Arkansas River until the 30th of June. The daily journeys would have to have been extremely short, and the smallest of creeks would have to be rivers. Further, the abstract indicates that the Mallet brothers

FIGURE 13



believed the stream reached on the 30th was "a branch of the Arkansas" (Folmer 1939:166).

If the River of the Arrow is the Arkansas River, however, there is a more reasonable interpretation. The route taken to that point would have been the Pawnee trail past Guide Rock on the Republican River, Waconda Spring on the Solomon, across the Saline and Smoky Hill Rivers to the Great Bend of the Arkansas near the mouth of Walnut Creek. From here, one could go upstream, but one would not find a river a day in that direction. One could also go south on another Indian trail, crossing Rattlesnake Creek, the Ninnescah, Medicine Lodge Creek, the Salt Fork of the Arkansas River, to the Cimarron. There once were some Spanish inscriptions, supposed to have been left by the Coronado expedition, at the Point of Rocks on the Cimarron River in the far southwestern corner of Kansas (Earl Monger, personal communication).

It is generally agreed that the Mallets returned from Santa Fe via the Canadian River. The abstract describes the river with the Spanish inscriptions as follows: "They believe this river is a branch of the Arkansas River and the same one which they found lower down on their return the tenth day after leaving Santa Fe" (Folmer 1939:166). Clearly, one reasonable interpretation of this phrase is that the river with the inscriptions is the Cimarron River, up which they journeyed, rather than the main branch of the Arkansas, as Folmer would have it.

Moving up the Cimarron River, they encountered a Laitane (Comanche) village from which they obtained an Arikara guide. This man knew the way to Santa Fe, as he had formerly been a slave there before being taken by the Comanches. He led them to Taos on what Governor Codallos y Raball later referred to as "the same route of the Jicarilla to the Pueblo of Taos" (Folmer 1939:169).

On the 14th of July, while still east of the mountains "they found still another river which they called the Riviere Rouge" (Folmer 1939:166). This is undoubtedly the branch of the upper Canadian called the Rio Colorado by the Spanish. In 1660, a Spanish expedition had traded with an Apache (presumably Jicarilla) ranchero on this stream (Blakeslee 1982).

The members of the expedition received a moderately friendly reception in Santa Fe--one that was not to be repeated for many decades. In May of 1740, they set out for Louisiana, leaving Santa Fe via Pecos to the Canadian River, this time the South Branch. Three days' journey downstream (from a point they estimated to be 35-40 leagues from Santa Fe), the party split into two groups. Three men "decided to leave their comrades in order to take the route of the Pani Indians and from there to Illinois" (Folmer 1939:170). This is as clear a reference as one can expect in so brief an abstract to the

presence of a known trail leading directly from the Canadian River to the Pawnee villages. According to Governor Bienville, both groups reached their destinations.

The Mallet brothers attempted to return to Santa Fe in 1741 by ascending the Arkansas and Canadian rivers. They did not succeed, but the failure of the expedition has been attributed not to them, but to Fabre' de Brujere, whom the governor appointed to lead the effort. Loomis and Nasatir (1967) indicate that he was hopelessly incompetent.

Pierre Mallet did return to Santa Fe a decade later. There is no known reference to his trip in French records, but his name appears in Spanish documents. In 1751, one Pedro Malec is listed (along with Juan Batista Boyce, Pedro Ojofrion, and Batista Roc) as having been arrested in Santa Fe and sent to Mexico City. Pedro Malec testified that he was among a group of men sent by Bienville to New Mexico in 1740. He has to have been Pierre Mallet; other Spanish misspellings of French names were far more outrageous. Mallet and his companions were sent to Spain from Mexico City as prisoners (Loomis and Nasatir 1967:56).

French Intruders, 1744-1752

In the decades following the Mallet expedition, a number of French traders and deserters reached Santa Fe. Most were treated in a less friendly fashion than the Mallet brothers, although some were allowed to stay and practice their trades. In the cases where the route is known, these men followed the Mallet brothers' route on their return from Santa Fe. That is, they ascended the Arkansas River and its tributaries to eastern New Mexico. The route of others is completely unknown.

The first of these Frenchmen to reach Santa Fe was one Jacques Velo (Belleau or Bellot?). Apparently, he was a deserter from the French service in Illinois. He arrived in Pecos in 1744, but his route there from Illinois (which included more than the modern state of that name) is not known. He was sent first to Santa Fe, then to Mexico (Loomis and Nasatir 1967:55).

In 1749 and 1750, other French deserters made their way to Santa Fe. These men, Luis Febre, Joseph Miguel Raballo and Pedro Satren (in 1749), and Felipe de Sandoval and six others (in 1750), went up the Arkansas River through a pair of Wichita villages (M. Wedel 1981). Febre, Raballo, and Satren were allowed to stay in New Mexico, where their skill in carpentry, tailoring and barbering were valued (Loomis and Nasatir 1967:55-56).

In 1752, two Frenchmen with better credentials reached Santa Fe. They were Jean Chapuis and Louis Feuilli--Xanxapij and Luis Fxuij to the poor priest who had to record their names. The route they took from Fort Chartres in Illinois to New Mexico is not known, but they said that it took them ten months. In spite of having a trading license signed by their French commandant, they were arrested in Santa Fe and sent first to Chihuahua and later to Spain (Loomis and Nasatir 1967:57).

John Peyton, 1774

The continuous intrusions of outsiders into Santa Fe was halted by the outbreak of the French and Indian War (1754-1763). The next crossings of the Plains originated in Santa Fe. In 1773, an Englishman named John Peyton was on a ship off the coast of Texas that was captured by Spaniards. He and some other men were marched from there to Santa Fe, up the Rio Grande River.

In 1774, he escaped with the aid of the jailer's daughter who was in love with Peyton's Jamaican servant. The three of them fled to St. Louis by a route that is not specified (Peyton 1929). Some historians doubt this story (Loomis and Nasatir 1967:205), but there are strong points in its favor. Specifically, Gil Ybara, a Spaniard who lived in eastern Texas, reported British ships in the Gulf of Mexico in 1774, including one at the mouth of the Neches River. Another ship was reported on the Trinity River, and a lone and naked Englishman was captured in 1777 (Loomis and Nasatir 1967:07).

The fugitives fled Santa Fe with three horses, a compass, an old French map, and muskets they had taken from the guards at the jail. The map can be identified as the Deslisle map of 1703, based on Peyton's names for rivers and his estimates of the distance between Santa Fe and St. Louis (Blakeslee n.d.). Peyton (1963) used the compass to set a straight line route directly to the northeast, but the magnetic declination for the region at the time put his course at about North 57 degrees East. From internal evidence in his account, it appears that he and his companions hit the Arkansas River somewhere in the vicinity of Great Bend. From there, they appear to have travelled up the south side of the Smoky Hill River, eventually crossing the Kansas River and following its north bank to the Missouri River. In Missouri, they found an Osage camp where they traded a musket for a canoe and hired a guide to take them to St. Louis.

This route apparently avoided both Indian villages and Indian trails. It kept them south of Wilson Lake by at least 20 miles. It is significant, however, in that Peyton stopped on the journey to do the first archeological excavation in Kansas for which we have a record (Blakeslee n.d.). He excavated a burial mound in the vicinity of the Arkansas River, and his interpretation of it -- that it belonged to a

civilization earlier than the Indians -- is the first recorded example of the Myth of the Mound Builders, an idea that dominated the first century of American archeology (Silverberg 1968).

"Trudo.", 1786

There is a unique document that records the presence of this person on the Pawnee trail. It is a notebook of drawings of petroglyphs and petrographs on the Saline and Smoky Hill Rivers sketched by J. R. Mead and now in the possession of his daughter, Ignace Jones. Mead, who was born in Vermont and raised near Davenport, Iowa, is one of the great figures of Kansas history. He came to Kansas in 1859 and in the same year went to the Salina River country where he established a "hunting ranch." He later moved to Towanda on the Whitewater River where he eventually began trading with the Indians of the region. Later still, he moved his establishment to a walnut grove at the junction of the Arkansas and Little Arkansas Rivers, where he helped to found the city of Wichita.

It was during the period of the hunting ranch on the Saline River that Mead recorded the petroglyph in question. It is an autograph:

TRVDO.
1786

Mead commented on this inscription in his notebook as follows:

The above inscription was discovered by the writer in a cave in Smoky Hill River, July 1861. 2-1/2 miles S.W. of "Wilson's" Station on U.P.R.R. Kansas. At that time, 1861, it was the land of the Buffalo and wild Indian Range and in a country almost unknown to white men.

Mead (n.d.)

Mead's location of the cave, southwest of what became Wilson, Kansas, puts the petroglyph near the crossing of the Smoky Hill River by the Pawnee trail. He saw many Indian petroglyphs in the same locality, and, according to local informants, at least some of these survive. The concentration of petroglyphs there, like those on the Saline River at Wilson Lake, are apparently related directly to campsites along the trail.

Who was Trudo? Similar names appear in the history of French Illinois, but they are usually spelled differently. Zenon Trudeau was Lieutenant Governor of French Illinois in the 1790's (Nasatir 1952 I: 80, ff.). Another person in the region was Jean Baptiste Truteau (sometimes rendered Trudeau and

Truteaux). He led the first expedition of the Missouri Company to the tribes of the Upper Missouri (Nasatir 1952 I: 86-93, 257-311). The two men were distantly related.

Jean Baptiste Truteau is almost certainly the person who left his name on the rock. He arrived in St. Louis in 1774, and by the early 1790's was experienced enough in frontier life to be given charge of a Missouri River company expedition to the Mandan. Although Nasatir (1966: 381-382) asserts that he always spelled his name Truteau, there are at least two documents he signed with the spelling, Trudeau (Mildred Wedel, personal communication).

The document that clinches his identity is a manuscript version of his description of the Upper Missouri country. This manuscript was plagiarized and published by Perrin du Lac, with a few changes to hide the identity of the true author. One of the items omitted by du Lac is a mention that the author (Truteau) learned how to make cache pits when he lived for three years among the Republican Pawnee (Mildred Wedel, personal communication). The Republican Pawnee, at the time, were living in a village on the Republican River, either in northern Kansas or in southern Nebraska. In either case, the village would have been located on a branch of the Pawnee trail (see sections on Pedro Vial and Zebulon Pike for discussion of the locations of these villages).

The version of the name that is written on the rock is not an unusual sort of abbreviation for the period. One finds, for instance, "Pado" as an abbreviation for "Padouca." Further, it was common practice to abbreviate personal names as well as other words (Mildred Wedel, personal communication). It is clear, therefore, that Jean Baptiste Truteau was the man who wrote his name as "Trudo" at the Smoky Hill River crossing of the Pawnee trail in 1786.

Pedro Vial, 1793

Pedro Vial was born Pierre Vial in Lyons, France. By the year 1779, he had made his way, not only to the New World, but far beyond the French settlements (which had been transferred to Spain in 1763) to Indian villages somewhere on the Plains. In that year he rescued a Spaniard from captivity while he was going from the villages to New Orleans. The commandant at Natchitoches described him as a gunsmith who repaired arms for the Indians (cited in Loomis and Nasatir 1967: 264-265).

By 1786, he was in Texas, and in the next year he blazed a trail from San Antonio to Santa Fe via the Taovaya villages on the Red River (Loomis and Nasatir 1967:265-287). There are indications in the diary he kept while on this journey that he followed Indian trails at least part of the way.

In 1788 and 1789, he was on the road again. This time it was a longer journey, from Santa Fe to Natchitoches, thence to San Antonio and then back to Santa Fe. Again there are references to Indian trails and Indian guides (e.g., Loomis and Nasatir 1967: 321, 323, 344).

In 1792, he set out from Santa Fe again. With two companions, he left Santa Fe for St. Louis via the Comanche and Osage. He travelled via Pecos across the Gallinas River to the "Rio Colorado". He travelled down this stream for twelve days before heading northeast toward the Napestle, or Arkansas River. On four successive days, they encountered four rain-swollen streams, all apparently tributaries of the Rio Colorado. A day and a half of travel after that brought them to the Arkansas River (Loomis and Nasatir 1967:372-376). Apparently, they reached that stream at its southward bend, as he noted during the next day of travel that the river flowed toward the northeast.

They did not get far, however, before they were captured by Kansa Indians. All three narrowly escaped death when one Indian (perhaps not a Kansa) recognized Vial from a time when both were in St. Louis. The Indians then took the captives to their village, a journey of ten days that Vial estimates covered 50 leagues. He gives no details of streams crossed or direction travelled. He states, however, that they took him to a village on the Kansas River (or one of its tributaries?).

If the distance travelled is correct, the village would have to be on the Smoky Hill River downstream from Wilson. The most direct route there would have been via the Arkansas River to the Great Bend and then north along the Pawnee trail.

Vial and his companions were rescued from the village by a French trader several weeks later. They travelled from there to the mouth of the Kansas River by boat, a trip that Vial estimated covered 312 miles. This appears not to match his other distance, but it is more difficult to estimate distances travelled on a meandering stream than it is on a straight-line march. Vial over-estimated the river distance from the mouth of the Kansas to St. Louis by 30 percent (Loomis and Nasatir 1967:379n). If the same correction is applied to the distance along the Kansas River, the village would be somewhere in the vicinity of Ellsworth, a good match with the previous estimate.

The journal of the return trip provides more precise information, although it still leaves much to be desired. In June, 1793, he left St. Louis by boat up the Missouri River to the mouth of the Little Nemaha River in what is now southeastern Nebraska. He states that this spot is a rendezvous for all traders who have business with the (Republican?) Pawnee. From that point they went overland with Pawnee guides to a village that must have been on the Republican River. Loomis and Nasatir (1967: 401) put it on the Smoky Hill, but this matches neither Vial's diary entries nor

known village locations. There is a hint later in the journey that the village is the site known as the Kansas Monument site. It is located in western Republic County, Kansas. The route followed is the trail shown on the Souldard map of 1795 (Nasatir 1952: facing p. 46).

After a stay of several weeks, Vial and company set out with Pawnee guides for Santa Fe (Loomis and Nasatir 1967:401-405). The first day, they travelled southwest for three leagues and camped on the same stream where the village was located (Loomis and Nasatir 1967: 401). This entry corresponds with the location of the Kansas Monument site, but not with the Pike Pawnee village in Nebraska (Fig. 14).

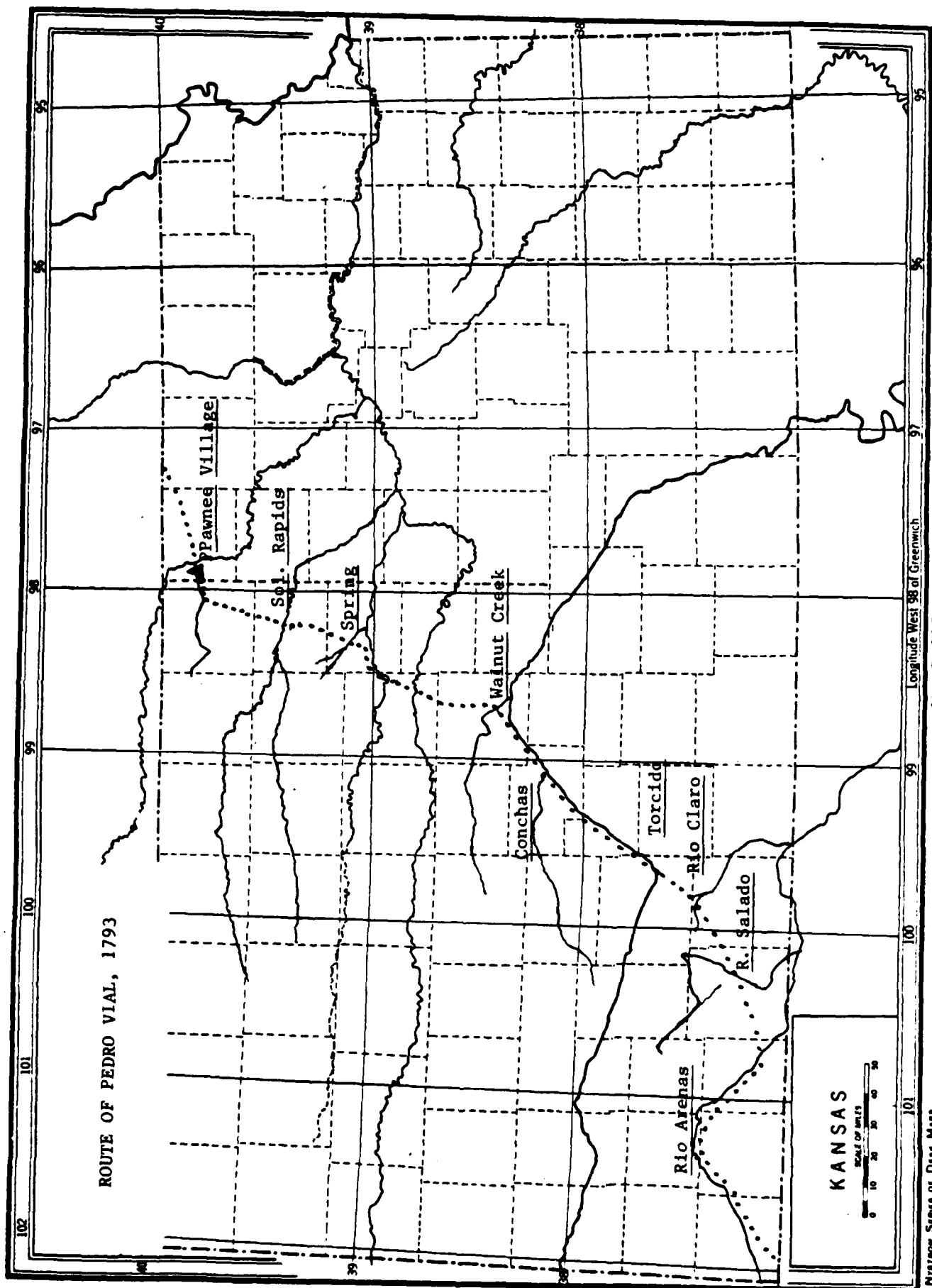
After two more days of travel, estimated at 10 leagues (26 miles) they stopped on the banks of a small stream. This would be the Solomon River, and presumably the camp was at Solomon Rapids. Three days and 20 leagues later they camped near a "running spring". This must have been near Spillman Creek, for the next day, their journey was to the west, rather than to the southwest. Apparently, they moved from the Mead branch to the main branch of the trail at this point.

They travelled seven leagues that day and camped on "a small stream that flows into the Kansas River" (Loomis and Nasatir 1967: 401). This must be the Saline River, and the camp would be in the Wilson Lake area. From there they travelled southwest once more another seven leagues. This would have put them at the Smoky Hill River crossing, but there is no mention of the stream. Two days and 13.5 leagues later, they reached a small stream (Walnut Creek) described as flowing into the Arkansas River. They continued southwest the next day, reaching the Arkansas River after a journey of three leagues. Continuing along this river, they crossed the Concha (Pawnee Fork) and "stopped to sleep at the torcido" (Loomis and Nasatir 1967:401). Torcido is Spanish for twist and refers to the south bend of the Arkansas River. In later years, this was the lower crossing of the Santa Fe trail because of the good ford there (Chittenden 1935 II: 536). At this point, Vial is close to where the Kansa had captured him on his outward journey.

They left the river at that point and journeyed across prairie to the Rio Claro (Bluff Creek) in one day and to the Rio Salado (Crooked Creek) the next. Another day of travel brought them to the Rio Arenos (Sandy River, i.e., the Cimarron). They went up this stream for several days before striking south to find the Colorado (Canadian) River. They then followed this stream toward Pecos. Near that town, he mentions travelling "along the road that the Comanches take when they come to trade" (Loomis and Nasatir 1967: 404).

The route home is thus obviously along the Pawnee trail. The itinerary is anchored firmly at one end by the Republican Pawnee village, in the middle by the torcido of the Arkansas

FIGURE 14



River, and at the other end by Pecos Pueblo. Furthermore, for most of the journey, Vial had Pawnee guides who would have used the trail familiar to them. Even when he had lost his guides, he mentions using an Indian trail.

Pedro Vial attempted two later journeys to the Pawnee, but both ended in failure far from their destination. Nonetheless, his place in the history of the Plains is secure. Of all of the people working for the Spanish government from Santa Fe, his knowledge of the geography of the Plains and of the people who inhabited the region was the most complete. His map of the Plains was by far the most accurate for the whole area of any drawn before him, and it was many years before a more accurate rendition was produced (Loomis and Nasatir 1967: 380-385).

The Voyageurs of 1803-1805

In the years 1803 and 1804, there were several expeditions to and from Santa Fe. The documentation for these is extremely poor, so that in some cases the routes taken can only be guessed. Several, however, were associated directly or indirectly with the Pawnee and appear to have used the Pawnee trail through the Wilson Lake area.

In 1803, one Jose Gervais accompanied a group of Pawnees to Santa Fe in order that they might make peace with the Spanish. He and his party returned in the spring of 1804, whereupon he signed on as a guide for some merchants who wished to go to New Mexico to trade. The latter were financed by Mr. Morrison of Kaskaskia, Illinois, and included Jeaunot Metoyer and Baptiste Lalande. They are known to have gone up the Missouri and Platte rivers to the Pawnee villages there, but the rest of their route is speculative (Barry 1972: 50). Some Pawnee are said to have accompanied them. The most direct route, and one that we know would have been familiar to the Pawnee, is the trail that led from the Pawnee villages to the Great Bend of the Arkansas River and from there to Pecos and Santa Fe.

Morrison equipped Lalande and Metoyer and sent them to meet Gervais among the Pawnees along with more supplies and goods intended for Gervais. Gervais (or Chalvert) was described as one "who knows the road well" because he had taken some Pawnee to Santa Fe to make peace in 1803 and 1804 (Loomis and Nasatir 1967: 172-173). Lalande and Metoyer were to meet him on his return to the Pawnee country.

Presumably, when Chalvert or Gervais visited the Pawnee in 1803 or early 1804, he made arrangements through one of Morrison's agents there for guiding these men to Santa Fe in return for an outfit (i.e., trade goods) for himself. Under these circumstances, it does not appear likely that he would have been confused with Pedro Vial as Nuttall suggests (cf.

Loomis and Nasatir 1967: 422).

The man called Jose Gervais may have been known by other names. It is likely that he is the man called Joseph (or John) Chalvert (or Calbert, Jarvet, Jarbet, Janvert, and Jarvai) who was born in Philadelphia about 1757 and left that city for the frontier in 1789 or 1794 (Loomis and Nasatir 1967: 172, 412). Loomis and Nasatir (1967) are doubtful that Gervais and Chalvert are the same man. The similarities in name and occupation are overwhelming, however, and the differences in spelling are not as striking as others recorded in documents of the period.

Chalvert journeyed via Fort Pitt down the Ohio and Mississippi Rivers to Natchez and then New Orleans. From there he moved to Natchitoches and then to the villages of the Taovayas and Towakonies in northern Texas. There he lived for 14 months, hunting bison and mustangs and perhaps repairing guns for the Indians (Loomis and Nasatir 1967: 412).

By 1803, he was in Santa Fe. There he was hired as interpreter for the Pawnees, and he accompanied Pedro Vial on one of his attempted trips to the Pawnees (Loomis and Nasatir 1967: 174). Melgares, in 1806, returned to Santa Fe with a half-breed son of Chalvert that he found living among the "Pani", presumably the Taovayas of the Red River. The boy was approximately 10 years old in 1806, a fact that places Chalvert on the Red River in 1795 or 1796.

In 1818, Melgares chose Jose Chalvert to lead a Spanish party to check on the American Yellowstone expedition. Apparently, he led 15 men in the direction of the Yellowstone River from Santa Fe, but found no trace of the Americans, who got no farther up the river than eastern Nebraska. Two years later, however, a sutler from that expedition, David Meriwether, was to be a prisoner of Governor Melgares in Santa Fe.

One of the two men that accompanied Gervais to Santa Fe was to figure in later expeditions. He is Baptiste Lalande who later accompanied Pedro Vial, Juan Chalvert, and Lorenzo Durocher on an expedition intended to reach the Pawnees in 1805. On that trip, which was cut short, he got himself in trouble by predicting that the Americans would win the allegiance of the Plains Indians from Spain simply because they had a greater supply of trade goods and gifts. This statement was taken as a sign of allegiance to the enemy (Loomis and Nasatir 1967: 174).

Apparently, Lalande settled in Santa Fe, where Loomis and Nasatir (1967: 172) claim that he was a big hit with the ladies. In 1807, he was sent by the Governor of Santa Fe to determine Zebulon Pike's intentions. Pike forced him to confess this at saber point while Lalande was being held down by some of Pike's men. Pike was also interested in recovering

Morrison's investment, which he claimed Lalande had taken as his own (Coues 1895 II: 500-502). Pike was not successful in this, and Lalande remained in Santa Fe where he died, leaving a large family and a considerable estate (Loomis and Nasatir 1967:457).

Two other traders also started for Santa Fe in 1804. They are Jacques d'Eglise and Laurent (or Lorenzo) Durocher. Nothing is known of the route(s) they took or even if they travelled together. Durocher is recorded as being in Santa Fe in 1805, and d'Eglise in 1806. Durocher had previous experience; he was one of four traders to share the Kansa trade monopoly in 1794 (Nasatir 1954 I: 211). He was described by the commandant at Saint Louis as an older man and one "who knew the road" (DeLassus cited in Loomis and Nasatir (1967: 422).

Jacques d'Eglise, who apparently accompanied Durocher the whole way to Santa Fe, was another experienced frontier hand. Indeed, he was one of the most important figures in the early exploration of the Upper Missouri. He had obtained a license to hunt on the Missouri in 1790, and by 1791 had reached the Mandan villages in North Dakota, the first Spanish subject to have done so (Nasatir 1952 I: 82-83). He returned to the Mandan in 1792, but was stopped from going upstream in 1793 by the Sioux and Arikara. He was among the Arikara again in 1794 and 1795.

In Santa Fe, which he reached in 1804, he was known as Santiago d'Eglise. There he was murdered in 1806; his killers were executed in 1809 (Loomis and Nasatir 1967: 457).

Other men reached Santa Fe in 1806 by a far more circuitous route. These were James Purcell, Juan Bautista la Croix, and Andres Terien. Purcell ("Dimas Prosul" in one Spanish record) left St. Louis in 1803 to trade with the Indians. While in Osage country he met Regis Loisel and accompanied him and his men up the Missouri River to Loisel's post at Fort aux Cedres in present South Dakota. From there, Purcell, la Croix and Terien were sent to a far outpost, the "house or fort called de la cuente azul" (Loomis and Nasatir 1967: 423), somewhere near the headwaters of the Missouri River.

Leaving that place, they went to trap on the headwaters of the Platte River. Here they were captured on two separate occasions by Kiowas. Eventually they reached Taos in the company of two Cuampe chiefs (a Kiowa band). Juan Bautista "la Casa" (presumably La Croix) may have arrived separately from the others; he is reported as coming to Santa Fe in 1806 in the company of El Ronco, a Kiowa chief (Loomis and Nasatir 1967: 178). More likely, this is a return visit, as the two Frenchmen had apparently been set free at Taos the previous year (cf. Loomis and Nasatir 1967: 177).

When the little party arrived in Taos in 1805, they were

guided to Santa Fe by Pedro Vial. He also accompanied the two Frenchmen back to Taos. Purcell stayed in Santa Fe, where he was forced to work off his debt to the Crown by working at his trade, which was carpentry. He returned to the United States in 1824 (Chittenden 1935 II: 492). While wandering among the headwaters of the Platte River, he found a small amount of gold (Coues 1895 II: 758), a report that is repeated in the story of a later traveler, David Meriwether. Purcell told the story of his discovery to yet another traveler along the trail -- Zebulon Pike.

Facundo Melgares, 1806

In 1806, the Spanish regime dreaded the encroachment of the Americans anticipated since the Louisiana Purchase. Learning of the Pike expedition, they sent an expedition to cement relationships with important tribes and to prevent the Americans from entering what they considered to be Spanish territory. In mid-June, Lieutenant Facundo Melgares left Santa Fe with 100 dragoons, 500 militia men, and over 2000 horses and mules.

From Santa Fe, he went eastward to the Rio Colorado, a branch of the Canadian River, and followed this stream for 233 leagues. There he found a large Comanche village, numbering some 1500 souls. From there he headed north on a zig-zag route until he reached the Arkansas River. Leaving some of his party encamped there, he proceeded northeast with 350 men to a Pawnee village on the Republican River, arriving in late August or early September.

Melgares apparently had a guide or guides on the trip out from Santa Fe, probably men who had accompanied Pedro Vial. Perhaps it was Juan Chalvert, who had been appointed interpreter to the Pawnees on September 1, 1805 (Loomis and Nasatir 1967: 455). A clue that there was someone along on the Melgares expedition who had been to the Pawnee by the traditional route is the path taken by Melgares on the outward leg of his journey. Leaving Taos, he traveled far to the east on the Rio Colorado (Canadian) before angling back in a northwesterly direction to the southern end of the Pawnee trail (Figure 16). He could have taken a more direct route to the Republican River village by heading straight north if he had obtained a good idea of the true spatial relationships involved. Instead, the northwesterly detour was chosen, apparently to be able to retrace a known route--a fine strategy for someone who does not yet have a clear map of the region in his head.

The location of this village is known quite precisely. It is in Webster County, Nebraska, where there is an archeological site that fits the available descriptions of the Pawnee village precisely (Sheldon 1927). It is not the Pawnee village in

Kansas where a monument and museum to the ensuing visit by Pike are to be found.

Judging from the reception that Pike received, Melgares was quite successful in impressing the Pawnees. At the conclusion of the negotiations, he left them with a Spanish flag flying above the village, one which the Pawnees were most reluctant to pull down for Pike. In fact, Pike had to promise that the Pawnees could keep the Spanish flag before they would consent to replace it for the nonce with the American flag (Coues 1897 II: 414-416).

Melgares left the Pawnee village before Pike arrived and returned to his camp on the Arkansas River. From there, he moved up the Arkansas River to the foothills of the Rocky Mountains before turning south to Santa Fe.

Details of a portion of his route are known from Pike's journal and maps. This is the case because Pike, believing that the Spaniards had better guides than he, tried to follow their trail to the Spanish Settlements. In this he was only partly successful, as the movement of buffalo herds had totally obscured even the signs left by this large and recent expedition.

In Figure 16 is shown a portion of one of the Pike maps. On it, the campsites of the Pike party are marked by X's and some of the Melgares party campsites that he saw are designated by O's. On October 8th, the Pike journal mentions one of these campsites, consisting of a circle of 59 small fireplaces (Coues 1897 II: 420). This camp was encountered late in the day's march, probably on the north side of Porcupine Creek, a tributary of the Solomon.

Early in the next day's journey, the tracks of the Spanish expedition separated from an Indian trail. Pike apparently followed the former, and camped at the place that Melgares had camped, on the south bank of the Solomon. This spot is indicated on the map with both an X and an O. By the next day, Pike had lost the tracks of the Spaniards, but while camped on Spillman Creek, some Pawnees brought him horse bones from a Spanish camp on the same creek. Apparently, the horse had been butchered for food (Coues 1897 II: 423). The map shows Pike's camp but not that of Melgares.

The next Spanish campsites marked by Pike are on opposite sides of the Saline River. It is clear (see next section) that Pike crossed the river at the site of the present Wilson Lake dam. One Spanish camp is shown upstream from his crossing on the south side of the river. The other is shown downstream from it, apparently on high ground north of the river. The two camps probably reflect the two legs of Melgares' journey, going and coming. They are both placed on the map in positions appropriate for camps directly on the Pawnee trail. Therefore, it is likely that Pike was correct; Melgares did have better

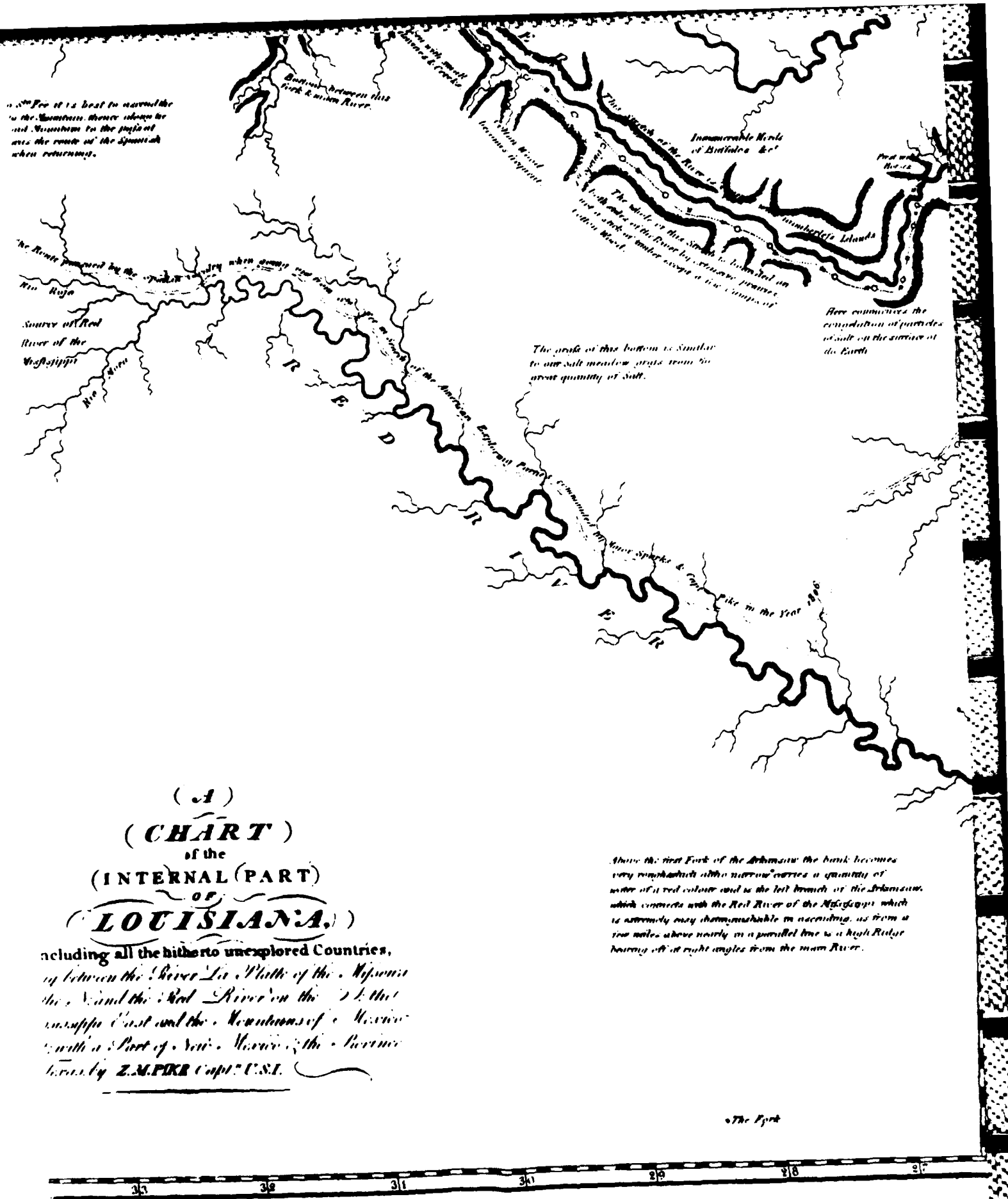
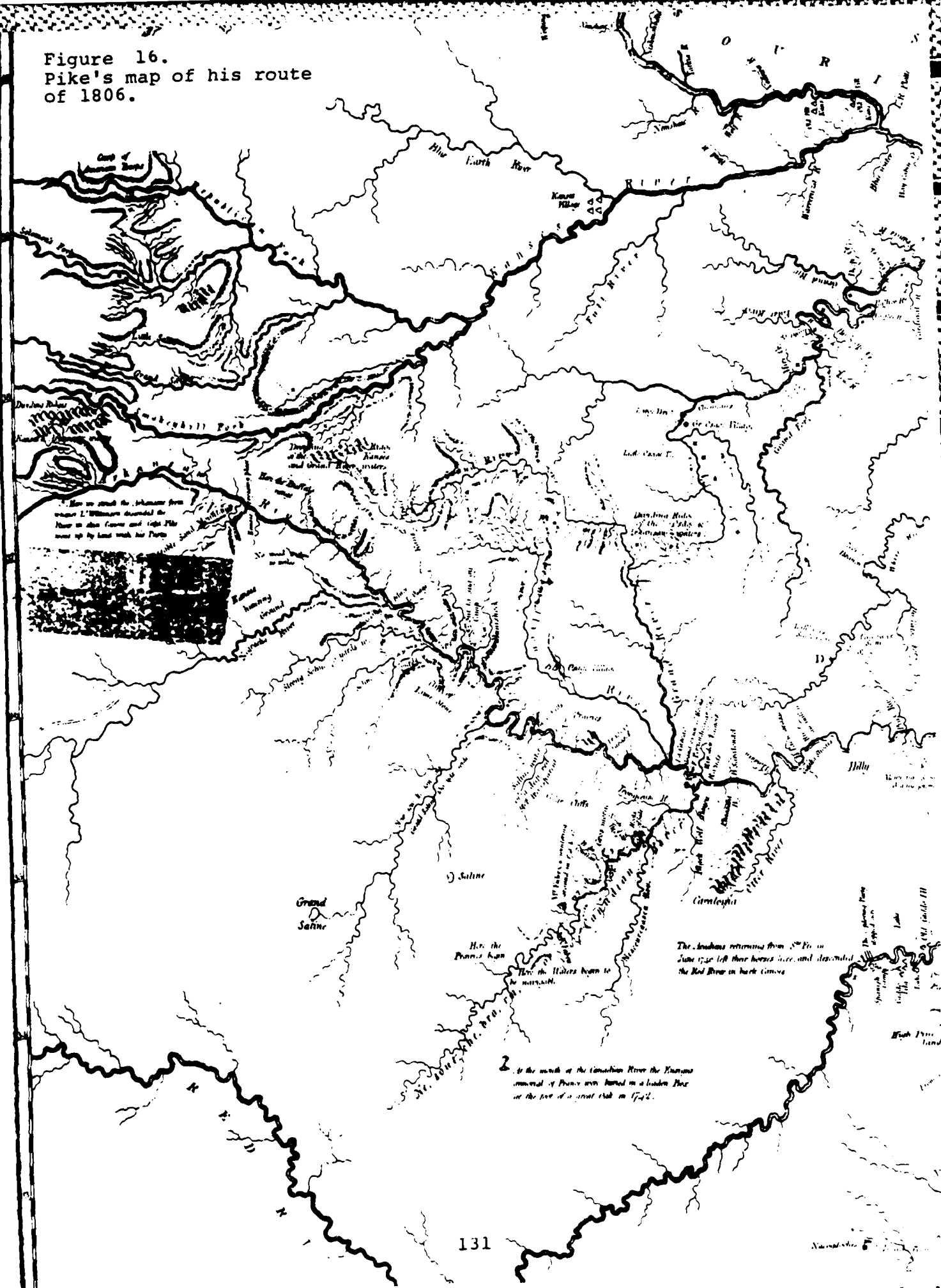


Figure 15. Route of Facundo Melgares to southern end of Pawnee trail.

Figure 16.
Pike's map of his route
of 1806.



guides than Pike himself. Pike did not find the Spanish trace again until after crossing the Pawnee Fork on the Arkansas River.

Thus Melgares camped twice near Wilson Lake. The camp on the north side of the river, if the map is at all accurate, may have been in the uplands northeast of the dam. The one on the south, however, must have been right at Wilson Lake. The two most likely locations are at the mouth of Hell Creek and at the present Minooka recreation area.

Zebulon Montgomery Pike, 1806

The expedition of Captain Pike in 1806 is one of the oddities of Kansas history. Conceived in conspiracy, it has elevated Pike to the undeserved status of hero--and has enshrined him in the annals of the state for an event that actually happened in Nebraska.

The expedition was not authorized by the federal government but was sent by General James Wilkinson on his own hook. Wilkinson, then Governor-general of the Territory of Upper Louisiana, was easily the most thorough scoundrel in the early history of the United States.

Wilkinson was born in Maryland in 1757 and took part in the Revolution. He was involved in the Conway Cabal against Washington; as clothier-general, his accounts were irregular. He resigned from the army but re-entered, becoming a brigadier-general in 1792, commander-in-chief in 1796, and governor of Louisiana in 1805. After investigation by a court of inquiry in 1815, he moved to Mexico, where he died. He was a troublemaker, engaged in treasonable activity as early as 1787, and in the 1790's he was constantly embroiled in plans to separate Kentucky from the Union and attach it to Spain--for which purpose he was in the Spanish pay ... He was a hard-drinking man with a passion for intrigue and a greed for money. He was so devious that he sometimes wrote letters anonymously and sent them to himself. He became involved in the Burr conspiracy to set up a republic in Texas, and was court-martialed in 1811 for his part in the plot after he had revealed Burr's machinations to the government--presumably to save his own skin. Many thought Wilkinson was the originator of the entire scheme. He was acquitted for lack of evidence that has turned up since.

Loomis and Nasatir 1967:66

Wilkinson was involved with a rogue's gallery of which he

was the central figure. His friends and colleagues included Aaron Burr, Dr. James O'Fallon, George Rogers Clark, Philip Nolan and Zebulon Montgomery Pike -- rascals and self-promoters to a man.

The hidden intent of the Pike expedition appears to have been tied closely to that of the Burr conspiracy--control of the entire American Southwest (Cox 1930). On the surface it was merely an expedition of exploration of some of the land acquired through the Louisiana Purchase. On a slightly deeper level, it was at the same time a military reconnaissance of the route to Santa Fe and an attempt to open Santa Fe to commerce (to the profit of Wilkinson and friends) (Loomis and Nasatir 1967: 236). At its core, however, it was intended to provoke the Spaniards to arrest Pike so that Wilkinson could retaliate by invading with an army of volunteers. Governor Alencaster of New Mexico learned this from Pike's orderly, Dougherty, who arrived in Santa Fe in 1807 separately from Pike and thus unable to coordinate his story with the Captain's (Loomis and Nasatir 1967: 242).

Pike left St. Louis on July 15, 1806. With him were Lieutenant James B. Wilkinson (the general's son), Dr. John H. Robinson, two sergeants, a corporal, sixteen privates, A. F. Baronet Vasquez (interpreter), and 51 Indians (Coues 1895 II: 359-360). The party travelled up the Missouri and Osage rivers to the Osage villages in western Missouri.

From there they travelled overland to the Pawnee, guided by Osage Indians who were careful to keep them well south of the Kansa, with whom the Osage were at war. First they travelled up a trail along the watershed between the Little Osage and Marmiton Rivers, entering Kansas in northeastern Bourbon County (Coues 1895 II: 394-396). They then crossed the upper courses of the Neosho and Verdigris Rivers to the Flint Hills. From there they travelled up the Cottonwood River and across the divide to the Smoky Hill River (Ibid.: 397-404).

The route to the Pawnee village then took Pike across the Smoky Hill River to the lower part of the Saline River. Here the party was forced to remain in camp several days because of rain. Travelling northwest from there they crossed Covert Creek to the Solomon River, then to White Rock Creek and on to the Pawnee village on the Republican River (Ibid.: 405-410).

The exact route taken by Pike from the Pawnee village to the Arkansas River has been a topic of debate for many years. There are several reasons for this. One is that the location of the village from which he left was not known precisely at the time (1895) that Coues produced the definitive volumes on Pike's expeditions. Another is that Pike's journal, like all of the others, is maddeningly vague at important points. For instance, at the time that they made the crossing of the Saline River, Pike and Dr. Robinson were apparently separated from the rest of the Party and were searching for the trail left by the

Melgares expedition. Finally, the map he drew is inaccurate in the details of some of the creeks. Nonetheless, it is now possible to trace the route accurately and to document that the expedition crossed the Salina River where Wilson Lake now lies. The details of the route presented here are different from those suggested by both Coues (1895) and Jackson (1966), although Jackson was close to being right.

The starting point is the Republican Pawnee village on the river of the same name. Two sites have been candidates for the one visited by Pike, one in Kansas and one in Nebraska. The site in Republic County, Kansas, is marked by a monument to his visit, but there is no doubt that the site of the visit is actually in Webster County, Nebraska, a short distance upstream. The arguments about the location are summarized in "The War Between Nebraska and Kansas" (Sheldon 1927). In particular, the details of his description of the landscape around the village fit the Nebraska location, but not the Kansas Monument site.

The Nebraska site lies on the Republican River between the town of Red Cloud and the old landmark called Guide Rock. With that end of the trail marked, it is possible to trace the route with some accuracy. This is especially so because of additional knowledge that we have of the Pawnee trail. Coues, who was never sure of some of the details of the route taken by Pike noted:

I understand that there was a certain "Pawnee trail" once well known from this village to Great Bend on the Arkansas. If this be now determinable, it will represent Pike's route with a closer approximation to accuracy than I have been able to follow out.

Coues 1895 II: 420n

Coues thus believed that Pike followed the Pawnee trail, and the fact that his journal notes several encounters with Pawnees as he journeyed south bears this out. Lack of knowledge of the exact location of the trail, however, hindered his interpretation of Pike's journal.

Donald Johnson (1966) who published an updated version of Pike's journals and related documents, also attempted to trace Pike's movements on this leg of the journey. Thanks to the work of previous scholars, he starts Pike from the correct Pawnee village, but his estimates of the positions of Pike's camps are well to the west of the actual route in the section from the Solomon River to the Smoky Hill River.

Jackson (1966: 331-332) is correct in the placement of the first camp: on Burr Oak Creek in Jewell County. The second on Oak Creek in Smith County is probably incorrect. Judging from the Fremont map of 1848, (Fig. 17), the camp is on Limestone

Figure 17. Fremont's
1848 map showing the
Pawnee trail.

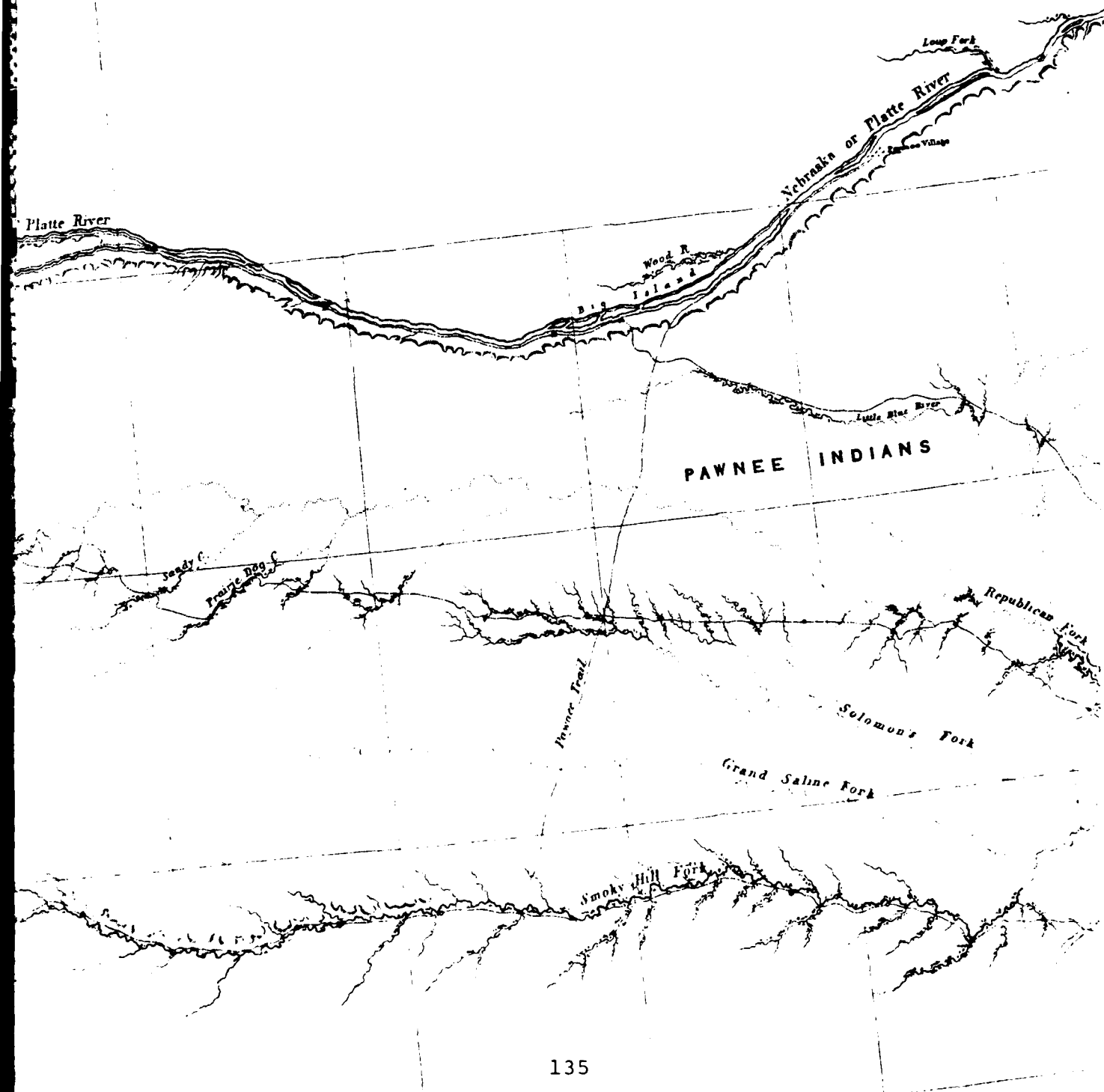
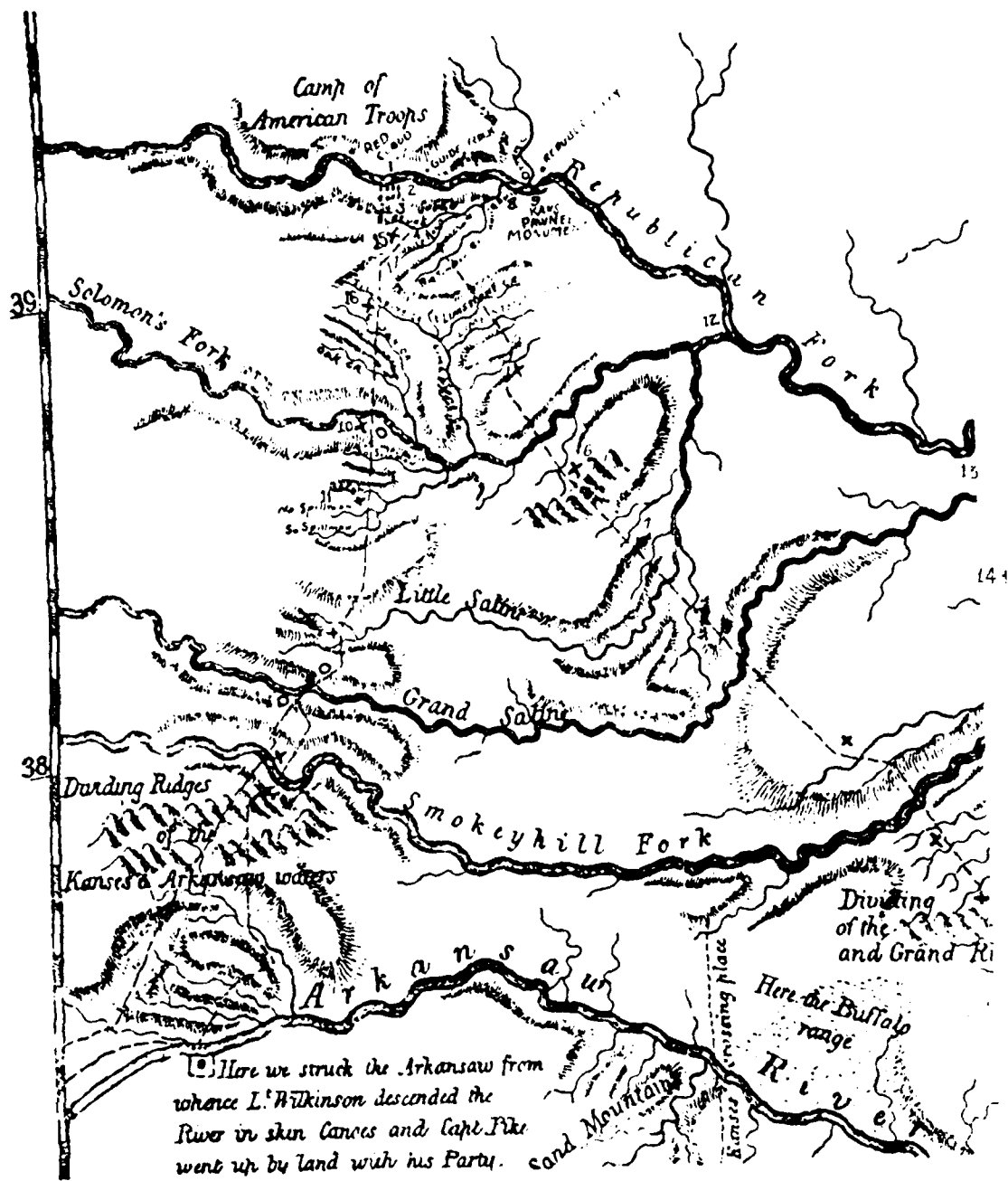


Figure 18. Pike's
route as interpreted
by Munday (1927)



Pike Map, 1806, Enlarged

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Creek, the next main tributary of the Republican, east of Oak Creek. The next position he estimates, on the North Fork of the Solomon River near Downs, Kansas, is nine miles west of the actual route. This, as indicated below, is at Waconda Spring, a well known landmark. The next day, Jackson (1966: 334) has Pike north of Wolf Creek and northwest of Lucas, Kansas. The actual position is northeast of that town, on Spillman Creek. The next camp he locates is on the Saline River "about 10 miles northeast of Russell..." (Jackson 1966: 334). This is on the upper end of Wilson Lake, about 12 miles from the actual crossing point. That Jackson is wide of the mark is indicated by the fact that his next estimated camp position, on the Smoky Hill River, some six miles southwest of Dorrance, would make Pike travel in a southeasterly direction. Pike's map of his route does show a detour to the east on this day, but that is followed by an even larger swing to the west before camp was made. The camp on the Solomon River is clearly shown as lying southwest of the previous camp, not southeast.

After this point, Jackson's version of the route becomes more accurate. He has the following camp on "Beaver or Coal Creek" (it was on Beaver Creek) and the following one on Cow Creek, which is correct (Jackson 1966: 334-335).

The actual route followed by Pike can be determined from 1) his journal, 2) his map of the route, 3) the Fremont map of 1848, and 4) knowledge of the terrain near Wilson Lake.

Pike left the Pawnee village on October 7, 1806, with a party that consisted of "two officers, one doctor, 18 soldiers, one interpreter, three Osage men, and one woman" (Coues 1895 II: 419). That day, they marched seven miles and camped on the Burr Oak branch of White Rock Creek. On the 8th, they headed south, passing one of the places where Melgares camped and reached "a large branch of the second fork of the Kansas River." This appears to be Limestone Creek, a tributary of the Solomon River, which is the second major fork of the Kansas River (after the Blue River).

The next day, Pike records finding "the forks of the Spanish and Pawnee roads" (Coues 1895 II: 420), indicating that the Spanish had left the normal route of the Pawnee trail or had followed one branch of the trail. That evening, while camped on "the Grand or Solomon Fork," they met two Pawnees who were apparently headed north along the trail, as they did not expect to encounter any whites (Ibid.: 421-422). If they had been travelling south, they would have known of Pike's visit to the Republican Pawnee village. Pike is evidently on the Pawnee trail where it crossed the Solomon River, near Waconda Spring, a spot holy to the Pawnee.

At this point, the journal becomes vague, with no distance marked or camping place described for October 10. The map of the expedition, however, indicates that this is the day they reached Spillman Creek. There is a mark on the map indicating

that they camped on the left bank of the upper fork of the creek. Here they once again met some Pawnees (Ibid.: 423).

The next stream crossed is Wolf Creek. This is the "Little Saline" River of Pike's map. It is appropriate to note that both streams are correctly identified in a version of the Pike map (Fig. 17) published by Munday (1927: 170) in "The War Between Nebraska and Kansas."

By turning west again after crossing Wolf Creek above its fork, Pike's trail leads directly toward the lower end of Wilson Lake. He was slightly off both the route of the Spanish expedition and the branch of the Pawnee trail that can be documented at Wilson Lake, as will be seen below.

The journal entry for October 11 indicates that the party camped on the "Saline," but the map indicates that the camp was on the "Little Saline," or Wolf Creek, between the forks. On the 12th, they crossed the Saline River, but the journal entry does not indicate where. It merely notes that it was crossed two or three times, as Pike tried to find the trail of the Spanish expedition.

The map once again gives a clear hint about the crossing place. Immediately after crossing the Saline River, the Pike expedition headed in a southeasterly direction to the interfluvium between the Saline and Smoky Hill Rivers. Here they turned to the west. Anyone who has been at the spot will understand the reason for this detour. Pike must have crossed the river exactly where the dam is today. From there, one must skirt around the deep and rugged Hell Creek canyon before it is possible to move toward the southwest. The only reasonable route is to follow the ridgetop to the southwest until one strikes the divide between the Saline and Smoky Hill rivers. From there it is easy walking west to the point where the Pawnee trail crosses the high ground.

It is possible that there was a branch of the Pawnee trail that crossed the river at the site of the present dam. Other Indian trails often had multiple branches, and while a crossing below the mouth of Hell Creek canyon implied a considerable detour for someone headed toward the Arkansas River at Great Bend, it would have given convenient access to high ground for anyone who wanted to head eastward at that point.

From the junction of the Pawnee trail with the Arkansas River, Pike and most of his company travelled upstream to a disastrous winter in the mountains of New Mexico. He was finally detained by the Spaniards, but by that time General Wilkinson was preparing to turn on Aaron Burr, and no invasion force was mustered (Loomis and Nasatir 1967: 245). From Santa Fe, he was sent south to Albuquerque, whence he was escorted by Lieutenant Facundo Melgares to Chihuahua (Coues 1897 II: 625 ff.).

Jacques Clamorgan, 1807

When Zebulon Pike set out from St. Louis, he encountered some opposition from the powerful fur trader, Manuel Lisa. A letter from General Wilkinson to Pike commanded him in turn to oppose the plans of an unnamed trader, undoubtedly Lisa, to establish a depot among the Osage for the purpose of trading with Santa Fe (Coues 1895 II: 574-575). Neither side, however, prevented the other from achieving at least partial success.

In 1807, a partner of Lisa, Jacques Clamorgan, made the trip to Santa Fe. Clamorgan was the founder of the Company of Explorers of the Upper Missouri, better known as the Missouri Company. It was long the dominant force in the fur trade economy of St. Louis. Clamorgan was the man who had sent Truteau, Lecuyer, Breda, Tabeau, and Henry up the Missouri River (Nasatir 1952 I: 86 ff.).

In 1807, Clamorgan was 74 years old, but in spite of this he decided to go to Santa Fe himself. The party included Clamorgan, three Frenchmen, and a black slave, and they took four mule-loads of goods from Lisa. The route is clear; they went up the Missouri and "Platte to the Pawnees, then cut across to Santa Fe" (Loomis and Nasatir 1967: 248). That is, they took the Pawnee trail.

When the party arrived in Santa Fe in December 12, 1807, they were sent on to Chihuahua. Rather than being arrested, however, Clamorgan was allowed to sell his goods there. This was the first friendly reception for an outsider since the time of the Mallet brothers. Clamorgan, who returned through Texas to Natchitoches in 1808, is credited with being the first American to make a profit from the Santa Fe trade (Loomis and Nasatir 1967: 248).

Unsuccessful Travellers, 1809-1817

After Clamorgan's trip, the gates to the Spanish Southwest were once again closed to outsiders. This did not prevent many from attempting the trip, however, and men from the east arrived in Santa Fe every year but one between 1809 and 1815. All appear to have met unfriendly receptions.

The first of these is the least known. In 1809, a man named Maria Raphael Henderson travelled along from Kentucky to Santa Fe. There is no information available regarding the route he took to get there. The only account of his arrival is a brief mention by James (1916: 287-288). James, another fur trader on the frontier, and one who eventually visited the Southwest apparently got the story directly from Henderson. Unfortunately, James dictated his own memoirs 25 years after his own travels, and details are lacking.

In 1809, a group of would-be traders used Pike's recently

published journal to guide them to Santa Fe. It took them, of course, to the Pawnee Republic village, down the Pawnee trail and then up the Arkansas River to a rude reception in Santa Fe.

The men involved include Robert McKnight, Samuel Chambers, and James Baird, and the group is usually known as the McKnight party. They arrived in Santa Fe on April 18, 1810, with some \$10,000 worth of goods packed on six mules. There they were refused permission to trade, their goods were impounded, and they were arrested and sent to prison in Chihuahua. There they stayed until freed during the Mexican revolution of 1820. In prison, they were charged 18-1/2 cents per day for their keep, which ate up half of the value of their impounded property.

The harsh treatment accorded this group probably derives from their talking too much. Chittenden (1935 II: 495-496) says they undertook the expedition because they thought that the Hidalgo revolution would succeed. According to Loomis and Nasatir (1967: 254), McKnight and company were charged with complicity in that uprising.

Only with the success of the Iturbide revolution were they freed. McKnight stayed in Mexico, returning only briefly to the United States with his brother in 1821 (Chittenden 1954 II: 496). He eventually became a citizen of Mexico and gained fabulous wealth in the copper mining industry (Loomis and Nasatir 1967: 260). Chambers and Baird returned to the United States, where both remained associated with the Southwest. Baird used the Santa Fe trail which came into existence in 1821.

Almost simultaneously with the McKnight party, another group of Americans headed for Santa Fe, but with a better story. The group, known as the McLanahan party for its leader, James McLanahan, included Reuben Smith, James Patterson, Manuel Blanco (the guide), and three black slaves. They left from St. Genevieve, a village on the Missouri River below St. Louis on November 20, 1809 and arrived in Santa Fe in February of 1810.

There they were jailed and their goods were confiscated. They innocently claimed to be looking over the country with an eye to settling there. They were nonetheless jailed but were released and returned to the United States in 1812. Their routes going and coming are unknown (Loomis and Nasatir 1967: 13, 249-250).

In 1811, four men set out for Santa Fe, but there is no record of their arrival. These men were companions of Ezekiel Williams, who went up the Missouri River in 1809 to Lisa's post in South Dakota. In 1811, Williams and 19 other men left that spot for the trapping grounds at the headwaters of the Arkansas and Platte Rivers. Eventually, the party broke into two groups, with half going west across the mountains to trap there. Shortly thereafter, the group that remained east of the

Rockies split once again, and four of the men headed for Santa Fe (Chittenden 1935 II: 645-646).

We do not know the names of these men or whether they ever reached Santa Fe. It is clear, however, that they followed roughly the same route as Purcell. The other men, who remained with Williams, even had the same sort of problems with Indians as Purcell did. Several were killed in an attack, and the survivors sought refuge with the none-too-benevolent Arapaho. Eventually, only Williams escaped with his life, returning to the east on the Arkansas River by canoe. On the way, he was robbed and held temporarily by the Kansa, much as Pedro Vial had been treated two decades before.

In both 1812 and 1814, there are accounts in the Spanish records of the arrival in Santa Fe of four Frenchmen. Those who came in 1812 are totally anonymous, but the Frenchmen of 1814, although nameless, are tied to a later expedition. This is the Chouteau-DeMun expedition of 1815-1817.

In 1815, three traders set out from St. Louis for Santa Fe with a large party. They included August Pierre Chouteau, Jules DeMun and Joseph Philibert. Chouteau was one of several members of that family that were prominent in the fur trade. His uncle, Rene August Chouteau, helped to found St. Louis in 1764. His father, Pierre Chouteau, was the sone of Pierre Laclide Ligest and half-brother to Rene' August.

DeMun and Philibert were partners with Chouteau in this venture. They started out for the Pawnee country, but on the way, Philibert sold his interest to the other two. Their intent was to meet with a large party of men that Philibert had sent out the previous year to the Platte and Arkansas Rivers. Philibert had set the rendezvous for Heurfano Creek, but when the party arrived there on December 8, 1815, Philibert's men were not there.

His men, 18 in all, had gone with Ezekiel Williams, Morris May and Braxton Cooper to the Arapaho in 1814 to recover cached furs belonging to Williams and to try to rescue two of his companions who had been prisoners among the Arapaho. Williams, May, Cooper, and one of Philibert's men returned to the east (Chittenden 1935 II: 646-647). The others remained to trap in the mountains.

Eventually, Chouteau sent DeMun on to Taos, where he found some of Philibert's men. It is likely that some of that party were the four Frenchmen noted in the Spanish documents in 1814. DeMun went on to Santa Fe, where he asked permission to trap.

The acting governor, Alberto Maynez, did not refuse permission or arrest DeMun; instead he sent for instructions. In the meantime, DeMun, Chouteau, and their men trapped in northern New Mexico for two years. During this interval, DeMun made a trip back to St. Louis for supplies in 1816. Chouteau

travelled to the mouth of the Kansas River to rendezvous with him, and both returned to the mountains with 45 men (Chittenden 1935 II: 497).

In 1817, their luck ran out. DeMun went to Taos to try to obtain permission to stay longer in New Mexico but was rebuffed. Eventually, all were arrested amidst rumors of the Americans having founded a fort with 20,000 men on the upper Arkansas River. The new governor, Pedro Maria de Allande, had them imprisoned and tried. All their goods were confiscated, but the men, a total of 21 of them, were allowed to leave with one horse each (Chittenden 1935 II: 497-498, 542-544; Loomis and Nasatir 1967: 256-257).

The exact routes followed during the peregrinations of Philibert, Chouteau, and DeMun are not known. There is a reference to Philibert's men being in the land of the Pawnees, and various travellers document the Southern Arapaho as having arrived on the upper Arkansas River shortly before 1816. The route out may thus have been by the Pawnee trail. The path back to St. Louis taken by DeMun is totally unknown, as is that of Chouteau to the mouth of the Kansas River. The route by which they both returned to the Southwest is also a mystery, as is that of their final journey back to St. Louis. If they had taken the route of the later Santa Fe trail, which would have been the most direct way to and from the mouth of the Kansas River, one suspects that either Chouteau or DeMun or at least one of their many men would have laid claim to the fame that fell on Becknell for opening this passage to Santa Fe. Therefore, a route up the Kansas River to some point where one of its branches intersects the Pawnee trail is more likely.

David Meriwether, 1820

One of the most interesting personalities to emerge from the American frontier was David Meriwether. Unfortunately, his accomplishments are some of the least well documented of any of the major figures of the time. The primary document for much of his life, and the only one pertinent to the use of the Pawnee trail, is an autobiography that Meriwether dictated to his grand-daughter when he was 86 years old (Meriwether 1965). This lacks details about important points and may omit entirely interesting events that an old gentleman would feel uncomfortable dictating to his grandchild.

David Meriwether was born in Virginia in 1800 but was raised from the age of five on the Kentucky frontier. In 1819, he was invited to go up the Missouri River by John O'Fallon, the sutler for the Yellowstone expedition (led by Stephen Long and Henry Atkinson). He served as an assistant sutler to the expedition and as an independent trader to the Indians. In these capacities he demonstrated the sort of boldness and self-reliance that were necessary for survival on the plains.

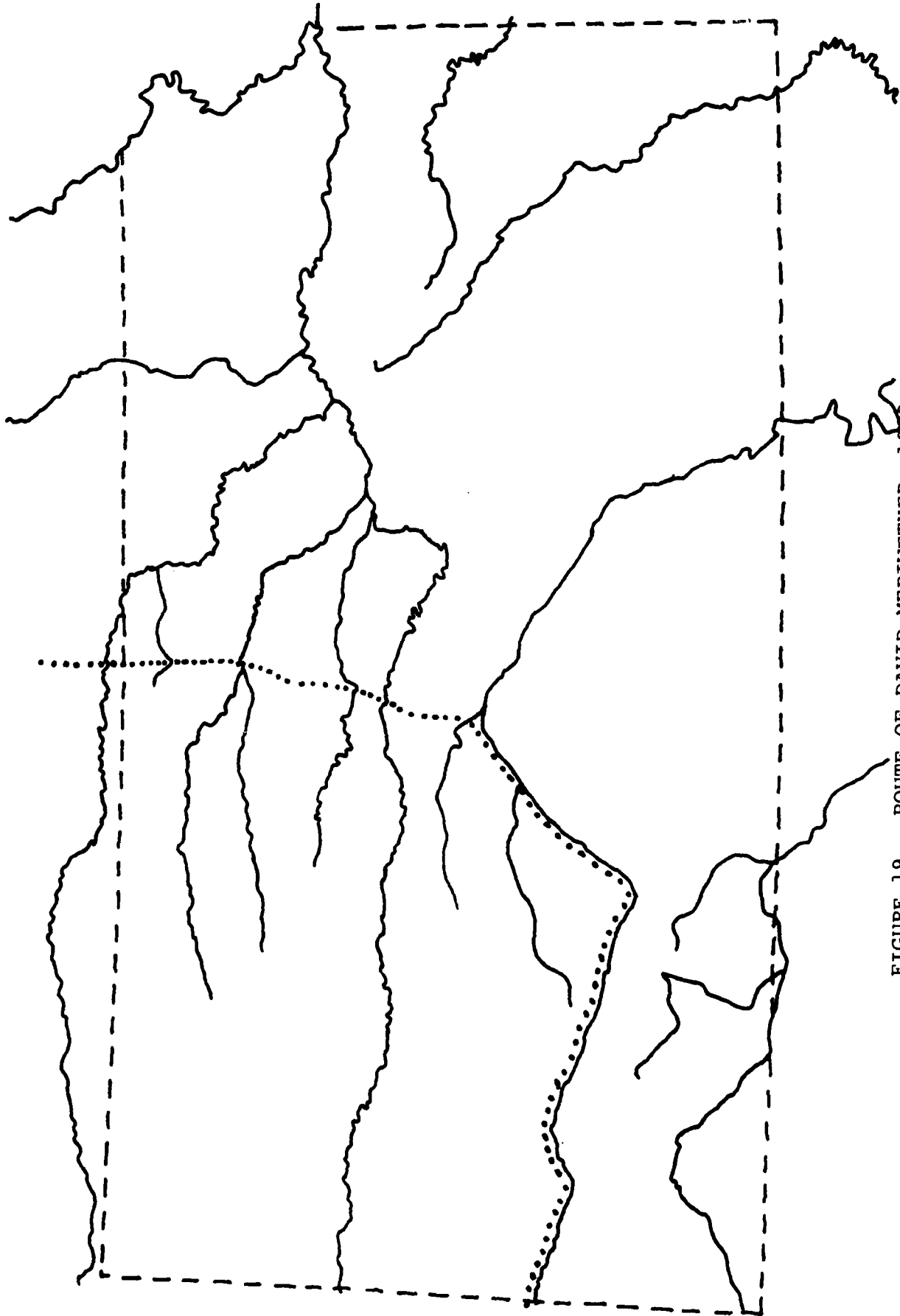


FIGURE 19. ROUTE OF DAVID MERIWETHER, 1820

On a trading expedition to the Pawnee villages in early 1820, Meriwether learned of expeditions by Pawnee war parties to the Southwest and of the presence of some gold there. He proposed to O'Fallon that he be allowed to go to New Mexico to "ascertain the practicability of a route for wagons and the amount of gold and silver in New Mexico" (Meriwether 1965: 81).

After a discussion with Captain Lewis Bissell, partner in the sutler and fur trade business with Colonel O'Fallon, it was decided that Meriwether would accompany a Pawnee war party to New Mexico. He therefore returned to the Pawnee villages with a black (slave?) named Alfred. In late June they left with a 17-man war party headed by a chief named Big Elk.

The only information offered as to the route is:

We travelled in a southeasterly [sic] direction over a country which the Indians appeared familiar with, until we reached the Arkansas River. During this time we saw immense herds of buffalo, antelope, some elk, a few deer, and often large droves of wild horses. We ascended the valley of the Arkansas River for about a week when we forded the stream, which was very wide but shallow, and very soon came into sandy, arid country, where game appeared less numerous.

Meriwether 1965: 83 (emphasis added)

The direction taken is obviously in error; it was southwest, not southeast. The fact that the Pawnee knew the countryside is of some interest, but the lack of any clear references to landmarks is maddening. There is a little information to go on, however. Some three decades later, on another trip to New Mexico, Meriwether recognized some landmarks from his earlier journey. These were seen from the Aubry, or upper crossing of the Santa Fe trail. Meriwether (1965: 154) said that this route lay somewhat east of the route taken by the Pawnee war party. This means that he originally reached the Arkansas River about a week's travel (by a lightly burdened war party) on foot from the Aubry crossing. This could readily place him at the Great Bend of the Arkansas River and the southern end of the Pawnee trail (Fig. 19).

After crossing the Arkansas River on the 1820 trip, the war party travelled south to the Canadian River. There Meriwether saw the tracks of men and horses, and as the Pawnees declined to take what he considered reasonable precautions, he and Alfred camped at a distance from them. At dawn, the Indians were attacked by Mexicans and all but three were killed (Meriwether 1965: 85-86). After the battle, Meriwether contacted the Mexicans and was immediately arrested by them. He and Alfred were taken to Santa Fe and imprisoned there.

The Spanish governor, Don Facundo Melgares, questioned Meriwether about why he was in Mexican territory. This was the same Facundo Melgares who had travelled the Pawnee trail in 1806 and eventually escorted Zebulon Pike to Mexico. Apparently, he kept this information from his prisoner, although he did interrogate him about what he knew of Pike's expedition (Meriwether 1965: 90-93). Meriwether in turn pretended that he knew nothing of such matters. It was a small world on the frontier, and both sides played by the same rules.

Meriwether was eventually released by Melgares on the promise that he never return to New Mexico. Meriwether and Alfred then rejoined the survivors of the Pawnee war party at a rendezvous point. To do so, they searched out the scene of the battle, and it is at this point in the narrative that Meriwether gives the only hint that their route to Santa Fe was a trail: "We were now on the trail which we followed before being attacked by the Mexicans, and we travelled on as fast as I could get my obstinate mule to go" (Meriwether 1965: 97).

The small party took a longer and less familiar route back. Because the winter season had begun and the Pawnee believed that few bison would remain along the route they had come out, they headed north along the foothills. Crossing the Arkansas River, they eventually came to a tributary of the South Platte where they settled in a rock shelter for the winter. Eventually (and it is clear that at times the Indians were not sure of their location), they reached the Platte River and travelled down it to the Pawnee villages.

Meriwether's unhappy experience in New Mexico is probably the only reason that the Santa Fe trail did not run at first from Nebraska rather than from Missouri, and it prevented him from being credited with being the first American to use the trail. His timing was bad; by the next year, Mexico had obtained independence from Spain and her policies were different. That year, William Becknell wandered into Mexican territory, was invited to trade at Santa Fe, and returned to Missouri with a handsome profit and credit for having founded the Santa Fe Trail.

Meriwether's expedition did have some effect on subsequent events on the plains. After returning to his home in Kentucky, he was called back to St. Louis in 1822 to provide information for expeditions then being planned. William H. Ashley and Michael Immell asked for his help, and he provided it.

Being somewhat of a surveyor myself, the young man and I soon constructed a rough map of the country, laying down the water courses and mountains from my memory, also marking where wood, water, and grass were to be found and noting what tribes of Indians might be expected to be encountered.

I advised this young man who was to accompany the expedition, to employ Big Elk or some other Pawnee familiar with the country, as guide.

Meriwether 1965: 120-121

The Mexican Expedition of 1824

Even though most of the documentation for expeditions along the Santa Fe trail has to do with those that originated in Missouri, many started from the other end, in Mexican territory. Like those from Independence and Westport, they too had problems with Indian raids. The Pawnee, in particular, were notorious for their harassment of the travellers. The reason for their enmity probably lies in the fact that the route established in 1821 passed through land that they claimed but avoided their villages, depriving them of gifts and trade goods that they felt should be coming to them.

In 1824, New Mexicans organized an expedition of 26 men from Santa Fe in order to make peace with the Pawnees. Since a direct approach to the unfriendly Indians was impossible, they made contact with the Pawnee through the Indian agent, Major O'Fallon, at Council Bluff. This is the same O'Fallon who enticed David Meriwether to accompany the Yellowstone Expedition.

There is no information regarding the route that these men took to and from Council Bluff. Since they were initially not on a friendly basis with the Pawnee, they probably travelled up the Santa Fe trail to Missouri and then up the river to Council Bluffs. On the return trip after the successful treaty negotiations, however, they may have returned to Santa Fe via the Pawnee villages and the Pawnee trail. From Council Bluffs, this was a shorter and more direct route and one that would have helped them, however temporarily, cement friendly relationships with the Pawnee. It was the road taken in the following year by the Pattie group, that also started at Council Bluff.

James O. Pattie, 1825

In 1825, an extremely large party passed down the Pawnee trail on its way to Santa Fe. Three things mar the narrative of this journey: 1) the author is something of a braggart and cannot always be believed, 2) he had an horrendously bad sense of geography, and 3) his reckoning of dates wasn't much better. The narrator is James O. Pattie, who in 1830 showed up in the office of an Ohio publisher and offered to sell the story of his life. The publisher, Timothy Flint, knew enough about the west to know that much of the story must be true. The details, however, put Pattie in the same class as James Beckworth, who

never let the truth stand in the way of a good yarn. As with Beckworth, the framework of his story was true, as later scholarship has demonstrated (Goetzman 1984: x-xi), but the particulars were often exaggerated.

In 1825 (not 1824 as he states), Pattie accompanied his father and a few friends up the Missouri River with the intent of trading with the Indians. At Council Bluff, however, they were forbidden to go farther, as they lacked a license to trade. Therefore, they decided to strike for the Pawnee villages in order to join forces with Sylvester Pratte and to accompany him to Santa Fe. No license to trade was required there. They had met Pratte, who was in business with the Chouteau family, while on their way up the Missouri River (Pattie 1984: 12).

They journeyed overland to the Pawnee villages on the Platte, several of which they visited. Pattie calls all of the South Band villages Republican Pawnee even though this name properly applies to only one of them. From one of these villages, the expedition set out to Santa Fe. Pattie claims that his father was elected to head the party and that it numbered 116 men with 300 mules and a few horses (Pattie 1984: 14).

Leaving on the 6th of August, they travelled first up the Platte to another Pawnee village. There, they supposedly ransomed a young boy from an intended sacrifice--a story that sounds suspiciously like that of David Meriwether, who had done just this in 1820. From there, they descended the Pawnee trail.

The first night out, they camped on the banks of a creek (the Little Blue River?). The second night they had a dry camp, but the third night they camped by a spectacular spring (Pattie 1984: 20), presumably Waconda Spring. After that point, the geography becomes vague, then fanciful. The next night was spent on the banks of a small, "nameless creek." and the one after that, beside "a small collection of water" (Pattie 1984: 21). After another day's travel, Pattie claims that they camped on one of the forks of the Osage--a distinct impossibility. They then spent some time buffalo hunting before moving on to a fork of the Platte that he calls Hyde Park--another flight of fancy. After several days' delay and a fight with some Crow Indians (who would have been well outside their normal range), they left this stream to travel south-southwest, apparently well to the west of the trail. They camped that night near water, the next night at a lake only six miles further on, and the next evening at a spring that he calls "Bellefontaine." There is a Bellefontaine spring near St. Louis, but this one is more apt to be in western Kansas. Pattie claims that the spring was near a column of rock, eighty to ninety feet high, that stood on perfectly level ground. It is possible that this is Castle Rock, in Gove County, Kansas, west of Wilson Lake. If so, the most likely route to that

point would have been down the Pawnee trail to its junction with the Smoky Hill trail, then west to Castle Rock.

Obviously, with geographic descriptions as bad as these, it is difficult to say when they left the Pawnee trail. They started out on the trail, however, and the description after crossing the Arkansas fits a crossing of that stream east of the southern bend, i.e., near the southern terminus of the Pawnee trail.

Moving up the Arkansas, the party met both Comanches and "Iotans." The Ietan are generally considered to be Comanches, but Pattie makes it clear here that they were not on particularly good terms with the Comanches. Charles Augustus Murray (1841: 365) also differentiates the "Haitans" from the Comanche, placing them north of the latter. Apparently, the Ietan, as they are usually called, were a fairly independent Comanche band.

The route from this point is described more briefly and also more accurately. They crossed the Arkansas and travelled in the sand dune country on the south side of the river. They then left that stream, presumably at the bend, and crossed to the "Simaronee," the Cimarron River. They travelled up this stream a distance before heading across an unnamed creek and (four days later) catching their first glimpse of the mountains.

Upon crossing the mountains, the geography once again becomes distorted. Suffice it to say that Pattie recalled passing through Albuquerque on his way from Taos to Santa Fe.

With so wild a narrator, how much of the story can be believed, and how important was James Ohio Pattie in the history of the West? Pattie's dates have been shown to be in error by as much as two years, but the later events, including sighting the Grand Canyon and being arrested in California have been documented by several historians (Goetzmann 1984: x). Goetzmann's (Ibid: viii) speculation that the major geographical errors were the result of Pattie and Flint using a copy of Pike's map, however, is not supported by the description of the trip down the Pawnee trail. Pike's map had some errors, but the Kansas section is nowhere near as bad as Pattie's description.

It is clear, nonetheless, that Pattie travelled part way down the Pawnee trail. It is also clear that he was one of the important figures in the opening of the west. While he may not have gone to the Yellowstone as he claimed, he was one of the first Americans to reach the Grand Canyon. Goetzmann claims that in his day, "Pattie had seen more of the West than any other man excepting perhaps Jedidiah Smith and Peter Skene Ogden" (Goetzmann 1984: ix).

Charles Augustus Murray, 1835

Fifteen years after David Meriwether crossed Kansas, another man with many of the same personal qualities travelled along the same path. This was Charles Augustus Murray, a Scottish peer, who toured widely in eastern North America. His sense of adventure lured him on a tribal bison hunt with the combined South Band Pawnees in 1835. He soon learned enough of their language and the Plains Indian sign language to communicate his basic needs, and he faced a wide variety of dangers with utter equanimity. When abandoned on the plains of Kansas by his Pawnee guides, he led his companions across country he had never seen before to safety at Fort Leavenworth. In the process, he learned much about Indian trails and preserved his knowledge in the form of a book (Murray 1841).

Murray's travels in America took him from New York to Niagara Falls, Toronto, Boston, Philadelphia, and eventually to Fort Leavenworth in Kansas. While he was there, the fort was visited by a party of Pawnees, and Murray was taken with the idea of accompanying them on the summer bison hunt. This he did with a German named Vernuft, his Scottish servant John, and an American youngster, John Hardy. They left with a small party of Pawnees to catch up with the tribe, which was leaving the Nebraska villages for the hunting grounds.

The route taken from the fort was northwest across the Big Nemaha to the Big Blue River. Thence they went across country to the Republican River on an Indian trail. They followed this stream upriver, finally catching up with the combined Grand, Tappage, and Republican bands (Murray 1841 I: 259-274).

The Pawnee appear to have hunted on the headwaters of the Kansas River that year, but the exact locations are hard to pinpoint from Murray's descriptions. At one point, he said that he could see in the distance the fringe of timber lining the Arkansas River. On another, he described a shaly height of land from which iron concretions as large as 32 pound shot were eroding (Murray 1841 I: 378, 372-373). This is presumably on the Cannonball River of the Kiowa winter counts, but the modern stream has not been identified.

Eventually Murray had to leave the Pawnee because he had, by what he considered honorable behavior, insulted a Pawnee chief. He agreed initially to travel away from, but parallel to, the trail in order not to chase the bison from it. After a false start, when he was forced to return by the "Great Pawnee trail," Murray parted company with the Pawnee on August 11th, except for two guides who were to take him to Fort Leavenworth. They rode northeast, eventually crossing the path of a small Pawnee party that was headed NNE toward the winter villages (along a trail?). Temporarily separated from his own party, Murray encountered another Pawnee and accompanied him to his temporary camp, apparently on the Smoky Hill River. Murray crossed this stream at night and found his way back to his own

party, being afraid to let the Indians know he was lost and alone (Murray 1841 I: 445-462).

The next day they encountered a small creek, and the following day crossed some barren ridges. Murray was told by his guides that they had to travel NNE because there was no water to the east. The Indian pointed out the "Snake River" in front of them, so named because of the many rattlesnakes found there. They travelled down a narrow rocky ravine to a river with brackish water, i.e., the Saline. Murray said he had never before seen so many serpents concentrated in the spot. There their guides abandoned them (Murray 1841 I: 463-473).

Murray then took it upon himself to guide his little group back to Fort Leavenworth. His first task was to get them out of the river valley and through the breaks to the uplands. He failed to do so the first day and ended up only a few miles downstream from the starting point. The following day, he followed a buffalo trace that wound its way up a long gorge to the uplands. They camped by a dry streambed. After the next morning's travel, they encountered a few Pawnee braves who were half a day's travel east of the route that the rest of their group was taking south to the buffalo hunting territory (Murray 1841 II: 1-24).

From there, they travelled in a generally northeasterly direction until they reached a large stream that flowed from the WNW (probably the Solomon River). This they followed upstream in order to intersect the Pawnee trail to the winter villages, so that they could be more certain of their route and of finding appropriate camping spots. This they found after travelling only 12 to 14 miles. They followed this trail, trusting it even when it turned briefly toward the northwest, and it led them to fords across creeks and eventually to the site of an old Indian village on what is surely the Republican River. Following it still farther, they finally encountered its intersection with the trail that led to Fort Leavenworth (Murray 1841 II: 25-54).

In his account of this trip, Murray provides an extended account of the appearance and nature of the Indian trails across the prairies. It is the best such description in the early Plains literature.

John Charles Fremont, 1842-1853

John Charles Fremont, "the pathfinder", made his reputation in a series of expeditions of exploration of the American West between 1838 and 1853 (Jackson and Spence 1970). During repeated trips across the Great Plains, Fremont never recorded using the Pawnee trail, but he did note its position and those of some other trails as well. Furthermore, his map of 1845 (Fig. 17) shows the clearest early depiction available of the Kansas portion of the Pawnee trail.

In 1842, Fremont mapped the Oregon trail through Kansas and Nebraska. In southern Nebraska, on the divide between the Little Blue River and the Platte, Fremont recorded "crossing on the way several Pawnee roads to the Arkansas" (Jackson and Spence 1970: 181). At this point, he was actually at the junction of several Indian trails, as the Oregon trail followed "Sublette's trace", which in turn coincided with an earlier Indian trail between the Kansa villages in eastern Kansas and the Pawnee villages in central Nebraska (Field 1957). The junction of trails probably explains the reference to "roads".

Also at this point, Fremont is crossing the route used by the Mallet brothers over a century earlier. It is his map of the trail that makes clear that the first stream south of the Platte crossed by the Mallet brothers was the Little Blue. It also shows that the trail intersects that stream where it flows toward the north-northeast (it eventually turns southeast to empty into the Big Blue River). This is a likely explanation for the assertion in the Mallet brothers journal abstract that the stream in question was a tributary of the Platte.

In 1843, Fremont once more headed west, but this time he took a route less travelled by whites (Jackson and Spence 1970: 430-433). Leaving the Oregon Trail at the point where it crossed the Kansas River, he travelled along the south side of that stream to the junction of the Smoky Hill and Republican forks. Here he crossed the former stream and travelled west along the south side of the latter. He then dropped south to "head some of the numerous affluents," i.e., to travel on the dividing ridge between the Republican and Solomon Rivers. He described it as "an excellent road, the route being over high and generally level prairies." He also mentioned that he was travelling "on the line usually followed by the trapping and hunting parties of the Kansas and Delaware Indians." At no point, however, does he say clearly that he is following a well-defined Indian trail.

On the 19th of June, however, he mentions crossing "the Pawnee road to the Arkansas" (Jackson and Spence 1970, I: 433). There is nothing in the text of Fremont's report that would allow one to establish exactly where he crossed the trail. The map he created, however, has fairly good detail along his routes of travel (and less away from it). His map shows the

fork of the Republican River, with the Pawnee trail crossing a northerly tributary downstream from that point. The stream in question is Limestone Creek, and the trail would have crossed the river at or very near Waconda Spring, a place holy to the Pawnee. On the return trip, Fremont travelled eastward along the south side of the Solomon River. His account does not mention the Pawnee trail, but it is shown on his map crossing the Solomon River just west of Beaver Creek (Fig. 17).

In 1853, Fremont headed west once more, but illness forced him to return to St. Louis (Jackson and Spence 1970, III: 393). He sent the rest of the party ahead with instructions to wait for him on the Saline River. Solomon Nuñez Carvalho kept an account of the advance party (Jackson and Spence 1970, III: 383-421), and some details in his journal allow one to locate the route and camp. They moved up the south side of the Kansas River, crossed it at its junction with the Republican and then continued up the north bank, across the Solomon to the Saline River. He describes the camp they made as "on the prairie, between the Kansas River on one side, Solomon's Fork on another, Salt Creek on the third, and a large belt of woods about four miles from camp on the fourth" (Jackson and Spence 1970, III: 410-411). The only spot that could fit this description is near the mouth of the Saline River, well to the east of Wilson Lake.

The camp, however, appears to have been on an east-west Indian trail. When Fremont, recovered from his illness and rejoined his party, he is described as having followed an "Indian trail which led to our camp from Solomon's Fork" (Jackson and Spence 1970, III: 412).

From the camp, they moved westward, eventually reaching Walnut Creek, which they followed upstream. They then crossed the divide to the Pawnee Fork and continued west-southwest, striking the Arkansas River at the crossing of the Santa Fe trail. This was at the South Bend of the Arkansas River, the torcido where Pedro Vial had crossed many years earlier. En route from Walnut Creek, they followed the tracks of a Cheyenne party (Jackson and Spence 1970, III: 414), and that whole section of the trip may have been along an Indian trail.

There are no descriptions extant of the leg of the journey from the camp near the mouth of the Saline River to Walnut Creek. One possible route would have been up the Saline River to the Pawnee trail and thence to Walnut Creek. Another would have been to cross the Saline River and to follow up the Smoky Hill River to the trail before turning south. The latter would have been familiar to Fremont, as he had descended the Smoky Hill ten years before. In either case, it is likely that Fremont used the section of the Pawnee trail between the mouth of Walnut Creek and either the Smoky Hill or the Saline River.

Summary

The Pawnee trail that passed through the Wilson Lake area was the primary route to Santa Fe prior to 1821. A few travellers reached the Southwest by going up the Arkansas and Canadian Rivers in the mid-eighteenth century (M. Wedel 1981), and even fewer made their way down the foothills of the Rockies from the north; most, however, used the Pawnee trail.

After 1821, with the establishment of a more direct route from St. Louis to Santa Fe, the Wilson Lake area became more isolated. The Santa Fe trail passed well to the south, while the Oregon trail led travellers north of the area. Only a few whites passed through along the trail, but Native Americans continued to use it. Both intertribal and Indian-White battles occurred along the trail until all of the tribes were placed on reservations.

The importance of the trail to the history of the American West is clear. Few features of the cultural landscape have had as significant an impact as this now obscure trail. Its effect on the distribution of archeological sites is discussed in another section.

The Nature of Plains Indian Trails and Associated Archeological Sites

The documents reviewed for the preceeding study of the Pawnee Trail provide valuable information regarding where Indian trails in the Central Plains are located, the logic behind the routes chosen, and the kinds of archeological sites that are associated with the trails. This section reviews this material.

Charles Augustus Murray, who walked the Pawnee Trail in 1836, provides the clearest insights regarding Plains Indian trails that are available in the literature. He notes that the main parts of the trails all follow divides between streams whenever possible. The advantage of travelling along the divides was, he said, "so well understood by all prairie travellers, that it is worth making a circuit of several miles a day to keep it" (Murray 1841, II: 29). While the practice of following the often sinuous divides added to the distance travelled, it avoided another hazard with which Murray had direct experience.

When he was abandoned by an Indian guide at the Saline River crossing, Murray spent a whole day trying to lead his party out of the valley. His first try was unsuccessful because he travelled across, rather than along the ridges.

...never since we entered the prairies of the west, had we been entangled in such a labyrinth of steep, irregular, and broken ridges as those which obstructed our progress when we attempted to leave the course of the stream. As soon as one height was attained, another and a higher arose before us. In the ascent the packs slipped over our mules' and horses' tails; in the descent, over their necks and ears.

Murray 1841, II: 2

When he finally accomplished the feat of leaving the Saline River valley, Murray soon noticed the advantage of travelling along ridge tops. The ridges comprise fairly level ground on which to travel, but of all the ridges, only the divides provide reasonable routes for long-distance travel.

If these ridges all ran in parallel lines, and were regular in their formation, nothing would be more simple than to get upon the summit of one, and keep it for the whole day's journey: but such is not the case; they constantly meet other ridges running in a transverse direction; and, of course, large dips and ravines are consequent upon that meeting. The "dividing ridge" of a district is that which, while it is as it were the back-bone of the range of which it forms a part, heads at the same time all the transverse ravines, whether on the right or left-hand and thereby spares to the traveller an infinity of toilsome ascent and descent.

Murray 1841, II: 30

The trick of long-distance travel, then, is to find the divide and to stay on it. This is not as easy as it might sound. The difference in height between the divide and ridges which spread out from it is often negligible, and which ridge is the divide is not always obvious. As Murray put it (1841 II: 30) "The first quality in a guide through an unknown range of rolling prairie, is having a good and a quick eye for hitting off the 'dividing ridge'".

Where a trail was well marked by the passage of many travellers, following it, and hence the divide as well, was easy. A large part of Indians left a set of tracks up to several hundred feet in width. These were composed not only of horse tracks but also of the travois dragged by the horses. The movement of large parties sometimes trampled the grass so heavily that even a prairie fire could not obscure the trail.

If a fire takes place on a prairie where there is already a distinct trail, it is as easy to follow it, if not more so than before; because the short and beaten grass offering no food to the fire, partly escapes its fury, and remains a green line upon a sea of black...

Murray 1841 II: 35

Trails were not always easy to follow however, even when a large group had recently passed along. In 1806, Zebulon Pike tried to follow the tracks of Facundo Melgares. Not only was Melgares travelling with hundreds of men, but the route he used was the Pawnee Trail, already marked by decades of travel. Pike lost the trail where a herd of bison had crossed and obscured it.

In spite of the problems caused by bison herds, not all Indian trails appear to have been purposefully marked so that the traveller could find his way along it with ease. There are several historic myths to the contrary, however. One is that the Llano Estacado in Texas was called the "Staked Plain" for the posts that the Indians used to mark trails across that featureless landscape. There is no documentation for this, and the lack is especially notable in the earliest accounts of travel along those very trails by Pedro Vial (Loomis and Nasatir, 1967). One also wonders why the Indians would have used wooden posts, which they would have had to import to this treeless area, in order to mark the routes.

There are also references to stone cairns marking some trails, with each traveller superstitiously adding a stone to each cairn as he passed. While stone cairns do exist along some trails, and although Isaac McCoy observed Indians adding stones to mark some piles (McDermott, 1945:415), it does not appear that most stone cairns marked the main parts of the trails or that travellers always or even ordinarily added stones to them.

Robert Blasing (1985) has investigated a section of a trail that follows the crest of the Flint Hills across Kansas. He found stone cairns, but these were not located on the trail but at the ends of some of the transverse ridges mentioned by Murray. The cairns are located above the crests of the ends of the ridges so that they usually are not visible from the valleys below. Hence they cannot mark access to the trail. They are, however, visible from the trail itself, and Blasing believes that they mark local resources for travellers. Most of the cairns he found lay above springs or chert quarries that could not be seen from the trail.

The stone cairns found at Wilson Lake (described in the next chapter) are located in positions somewhat similar to those recorded by Blasing, but their purpose may have been a

bit different. All of the cairns at Wilson Lake were found on the south side of the Saline River. They are at the ends of ridges, usually where a side valley joins the river valley. Unlike Blasing's cairns at Deep Creek, they are visible from below. It is likely that they served to mark points of egress from the river valley to the trail above. Getting out of the valley is not particularly easy at this spot. Charles Augustus Murray had an awful time trying to do so. So did some early hunters, who named the main side valley Hell Creek Canyon for the terrible night they spent there because they were unable to find a way out. Like most other Euro-American travellers, they seem not to have noticed the cairns.

Most cairns appear to have been fairly small, usually several feet high. On the Great Plains, cairns of that size can be seen from a considerable distance. They are not large enough, however, to conform with the idea that every traveller left a rock on them. In areas such as the Wilson Lake vicinity and the Flint Hills, where loose rocks are available everywhere, cairns supplemented by every traveller would soon reach enormous proportions. This did not happen; hence the story of the superstitious Indians is primarily a myth.

What, then, did McCoy actually observe when he saw Indians adding stones to a pile beside a trail? Perhaps they were adding stones to a burial mound that held the remains of a relative. Burials are found in direct association with trails (Blasing 1985) and rock-filled burial mounds contain many more stones than cairns. There may well have been a custom for relatives to add a stone to a burial, especially during the period of four years after death, when at least some tribes believed that the soul(s) of the dead were not completely at rest.

That some cairns may have marked spots where water was available, as Blasing suggests, seems reasonable. According to Murray, second only to the ability of a guide to keep to the divide was

...a ready and almost intuitive perception (so often found in an Indian) of the general character of a country, so as to be able to bring his party to water when it is very scarce.

Murray 1841 II: 30-31

Documentary research done in northeastern Nebraska (Blakeslee n.d.) indicates the use of a set of springs by Indians who followed a trail along the divide separating the waters of the Platte from those of the Missouri. In this case, the springs were not marked by a cairn, but a large cottonwood, the only tree for miles. Associated with the "lone tree" is evidence for a series of temporary camps.

Charles Augustus Murray, by far the best guide to the

nature of Indian trails on the Plains, describes two kinds of temporary Indian camps found along trails:

It requires no great experience or observation of Indian life to enable a prairie traveller to distinguish a mid-day from a night camping place: in the former he will often find some cut branches under which the party had sheltered themselves from the heat of the noon sun; in the latter, generally some scraps of charred wood, or round marks in the grass, showing where a fire had been made. Even where neither of these indications exist, there are other equally clear to a practised eye...

Murray 1841 II: 37

Neither sort of camp would be likely to leave much of an archeological site. Stone flakes from tool maintenance, the occasional lost or discarded implement, hearths (when preserved) and tipi rings might occur where evening camps were made. Noon camps are more likely to be manifested as isolated "find spots" if, indeed, anything at all is found.

Where springs or other features of the landscape made one spot preferable over another, archeological remains would have accumulated over many years to create substantial multi-component sites. In these, the contribution of each component should be sparse, and if deposition was slow, the accumulation of many components should obscure any activity areas associated with them.

It is likely that some permanent habitations will be found in association with trails. There are several reasons why this is so. First, in some cases, trails may have developed to link important villages, and the trails must therefore lead to the village sites. Second, trails can be expected to cross major streams at fords. In some cases, such as the Flint Hills Trail, the geological structure that underlies the divide will also create a rock ford in any stream that cuts across it. Furthermore, there are advantages to placing a permanent village next to a ford. The ford allows ready access to the land on the opposite bank, reducing the travel time that would be required if all resources had to be gathered from one side of the river. In addition, fords are often associated with waterholes in the stream that can provide water, fish, and shellfish to the village dwellers.

Finally, the trail may provide the reason for locating a village rather than the reverse. It is a well understood concept in geography that a break point along a route of transportation can lead to the development of a settlement. Geographers, however, tend to deal with large state-level societies in which the amount of goods being transported is large. In the case of prehistoric and early historic Indian trails, it is a moot question whether the flow of goods was

large enough to affect strongly decisions regarding the placement of villages. There are, nonetheless, clear examples of the association of village sites with stream crossings on Indian trails in Kansas and Nebraska. One is the Blue Earth village of the Kansa on the Kansas River; another is the Hill Site, a Pawnee village on the Republican River.

Another category of site that occurred along at least some trails is the animal lodge. Among Plains Indians, certain features of the landscape were believed to be the lodges or dens of certain animal spirits. The Hidatsa in their Earthnaming ceremony, for instance, revered twelve bluffs, in each of which resided the spirits of an individual animal species (Parks and Wedel 1985: 167). The Pawnee recognized at least 15 such sites, most of which were the homes of multiple, instead of individual, species.

The Pawnee sites are reviewed comprehensively by Parks and Wedel (1985). They provide the locations of all of the Pawnee animal lodges for which adequate information is available. The locations they report and the name of one of the lodges indicate that at least some were situated along trails.

Two, in particular, are associated with the Pawnee trail that ran through the Wilson Lake area. One of them is Pa:hu:ru', the Hill that Points the Way. Known in English as Guide Rock, it is on the south bank of the Republican River close to the ford at which the trail crossed the stream. The Hill and Shipman sites, historic Pawnee villages, are located a few miles upstream.

Further south, at the Solomon River crossing, is Kicawi:caku, the Spring on the Edge of a Bank. It is known today as Waconda Spring. Parks and Wedel (1985: 155) describe the spring as follows:

The mound was composed of hard and porous stratified limestone in the form of a truncated cone, 300 feet in diameter across the base and 150 feet across the top. The mound was essentially flat, and about 1-1/2 feet higher than the surface of the river terrace to the north. In the center of this mound was the spring vent, an inverted cone-shaped basin 35 feet deep at its center and from 52 to 56 feet in diameter.

Their description, based on photographs because the spring has been inundated by the waters of Glen Elder lake, matches nicely that of an early traveller along the Pawnee trail. In 1825, J.O. Pattie travelled to Santa Fe, starting from the Pawnee villages on the Platte and initially moving down the Pawnee trail. His account of Waconda Spring has been given earlier in this chapter.

Examination of the journals of various early travellers suggests that the average day's journey was roughly 20 miles. This figure was sometimes affected by inclement weather, straying horses, and other hazards, but it suggests that a predictable spacing between campsites may occur. This is especially likely to be the case along certain portions of trails. A crossing of a major stream is an obvious stopping point, and one might expect to see camps roughly 20 miles on either side of such a crossing. This is all the more true when the crossing spot was the site of a permanent village. The pattern of spacing will be obscured, however, when important resources are not evenly distributed. One might make a day's journey of only 15 miles or as much as 30 miles, if doing so brought you to a camping spot with firewood and water that otherwise would have been lacking.

Plains Indian trails, then, tended to follow the divides between major watersheds. Sites associated with the trails should include permanent villages, campsites, sacred sites, and isolated find spots. The campsites and find spots, under the right conditions, should tend to show a regularity of spacing that reflects a normal day's travel. Burial mounds and cairns will also be associated with the trails, although neither may occur directly on the trails. Cairns, in particular, should be sought at the ends of subsidiary ridges and should be associated with springs, quarries, and other resources.

The Historic Cultural Landscape

Features of the historic cultural landscape at Wilson Lake are far more obvious to the casual observer than those surviving from prehistoric times. They include the ubiquitous section line roads, the spacing and plan of towns along the railroad, stone bridges, stone fence posts, shelterbelts and other trees, and Wilson Lake itself.

The Wilson Lake area shares with a wide section of the central United States the pattern of section line roads spaced at intervals of one mile or multiple miles. The pattern is adapted to the General Land Office section and township lines, with modifications to fit the local landscape. Road building in Lincoln County began in 1871 (Barr 1908: 44), and at first a large number of the roads did not follow section lines but were adapted to the contours of the landscape. On the Russell County map of 1888, less than one quarter of the section lines were marked by roads, and about half of the roads did not run on section lines. Through time, more roads were added, almost exclusively along section lines, and some of the other roads were abandoned.

The region that includes Wilson Lake features stone masonry bridges. One of the earliest on record is the Paradise Creek

bridge north of the west end of Wilson Lake. It was built in 1902 (Muilenberg and Swineford 1975: 76-77). Another bridge, built across Big Creek near Gorham, was constructed in the same year. Two stone bridges found during the survey of Wilson Lake were erected by Works Project Administration (WPA) crews in the 1930's. Both are in Hell Creek canyon. The larger, a two arch bridge is visible from the highway. It is now in ruins, having collapsed in a flood shortly after the fieldwork was completed. The smaller specimen is a single arch bridge across a small side creek in Lucas Park.

South of Wilson Lake is a line of towns that includes Wilson, Dorrance, Bunker Hill, and Russell. Spaced six to eight miles apart along the Union Pacific Railroad tracks, they sprang up at railroad stations. The spacing of the towns and the way they are laid out are typical of railroad towns on the Great Plains (Hudson 1979).

Typical also of a smaller region are the stone fenceposts encountered repeatedly during the survey. The region is known as the post rock country after these features of the landscape (Muilenberg and Swineford 1975). The post rock country stretches south from the Nebraska state line to near Dodge City. It is from 10 to 40 miles wide, and at the latitude of Wilson Lake, it begins 30 miles west of Salina, i.e., in the vicinity of the lake.

The stone fenceposts were a response by settlers to a combination of sparse timber and a readily available stone substitute. It is the limestone stratum called the postrock. This stratum is the uppermost layer of the Greenhorn limestone, an 8 to 12 inch thick layer of massive limestone that is responsible for the flat-topped uplands around Wilson Lake. It outcrops at the top of the ridges and is covered by only a thin layer of soil.

The need for fenceposts arose as farmers settled the countryside. A series of state fence laws were passed favoring the creation of fences. The fence law of 1868 provided a reward of two dollars for every 660 feet of stone or tree (Osage orange or hawthorne) fence built and maintained for a specified period. It was followed in 1872 by the Herd Law, which specified that livestock owners were responsible for damage to farmers' fields that was caused by their free-wandering animals (Muilenberg and Swineford 1975: 28).

By 1873, the settlers in the post rock country had begun to create fenceposts from the limestone caprock. The typical process was to plow the soil above the postrock layer and to remove it with a horse-drawn slip. Holes were drilled every 8 to 10 inches in rows that defined the outline of the posts. Tapered rods called feathers were then tapped into the holes and a wedge driven between them to split the rock. The resulting posts were sold for prices that ranged from three cents to fifty cents. Prices of a nickle or a dime were the

most common (Muilenberg and Swineford 1975: 39-53). Two fencepost quarries, both outside federal property, were noted during the survey.

Other features of the cultural landscape are shelterbelts and individual trees. At the time of the GLO survey, trees were limited to a few restricted environments. There was a thin fringe of trees along the river and a few groves on some tributaries. Some of the side canyons supported a few cedars. The uplands were completely bare of trees, and most of the lowlands were as well.

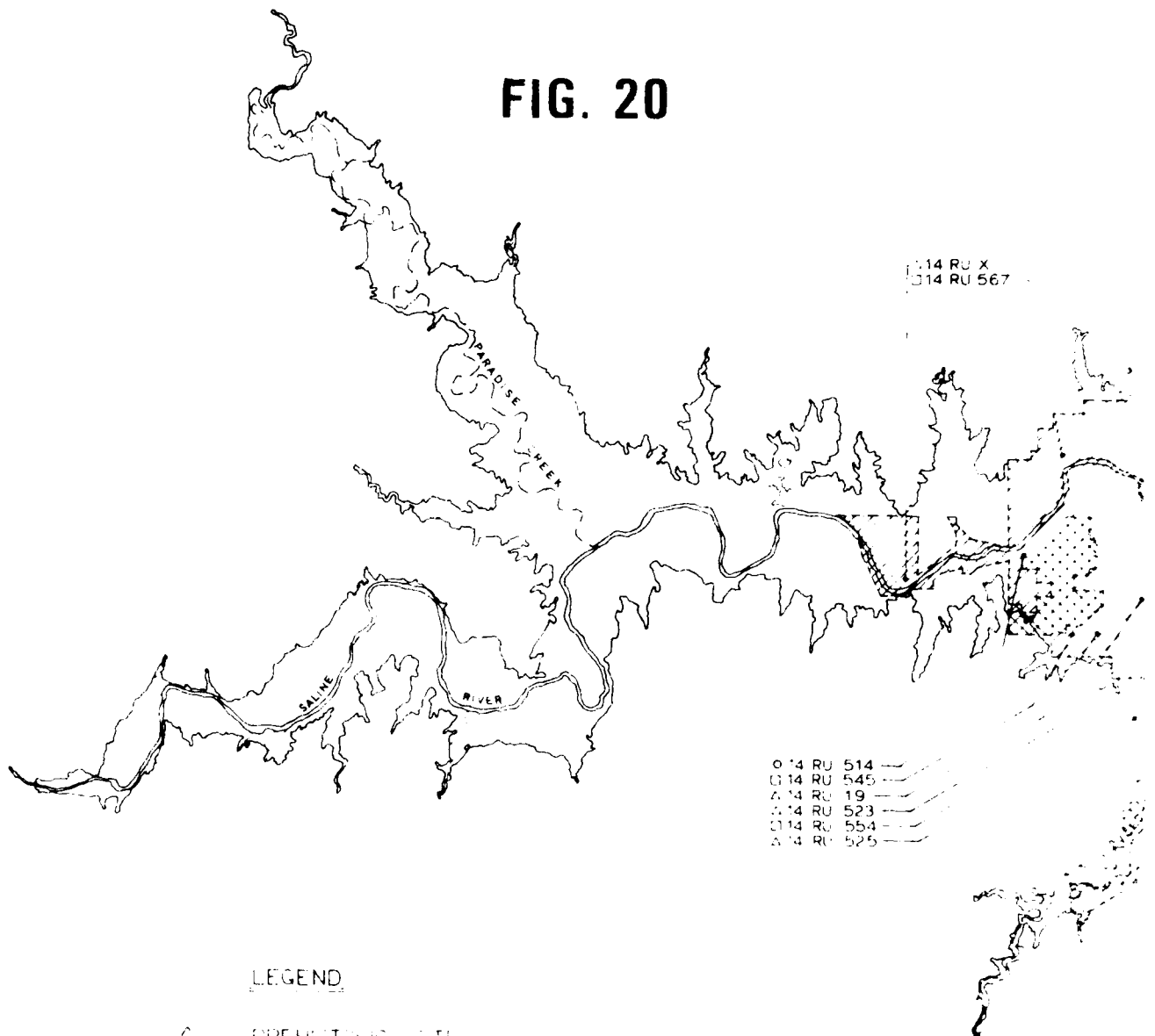
Because trees were needed for firewood and other purposes, tree-growing was encouraged by the government. The timber culture act of 1873 allowed homesteaders an extra 160 acres of land for planting 10 acres of trees and maintaining them for a specified period. The mother of Virgil Pangburn (personal communication) told stories about how she carried water to the trees planted by her family on Paradise Creek above Wilson Lake. Watering the trees was a chore assigned to the children of the family until the legal period had passed and the land was theirs. The irrigation then ceased, and the trees died. Several of the historic sites recorded in the next chapter came into private ownership through the provisions of the timber culture act.

After the devastating droughts of the 1930's, shelterbelts were once again encouraged. Other trees have grown up as well, their growth encouraged by landowners and by the suppression of the prairie fires that previously inhibited their growth.

Another important aspect of the cultural landscape is the organization and layout of farmsteads and ranch headquarters. Unfortunately, it proved impossible to study this adequately at Wilson Lake. Numerous old farmsteads were recorded in the survey area, but all but a few of these had been so thoroughly demolished that the organization was no longer apparent. The contractor who had cleared the sites when the lake was constructed did such a thorough job that in most cases the location of buildings, their function, size and orientation, could no longer be determined. In the cases of historic sites where some inkling of the spatial organization remains, a site map is included in the site descriptions in the next chapter.

The final and most prominent feature of the present cultural landscape is Wilson Lake itself. The lake and its associated wildlife refuges and recreation areas are the most ambitious cultural modification of the landscape to date. They have had a substantial impact on the economic life of the area.

FIG. 20

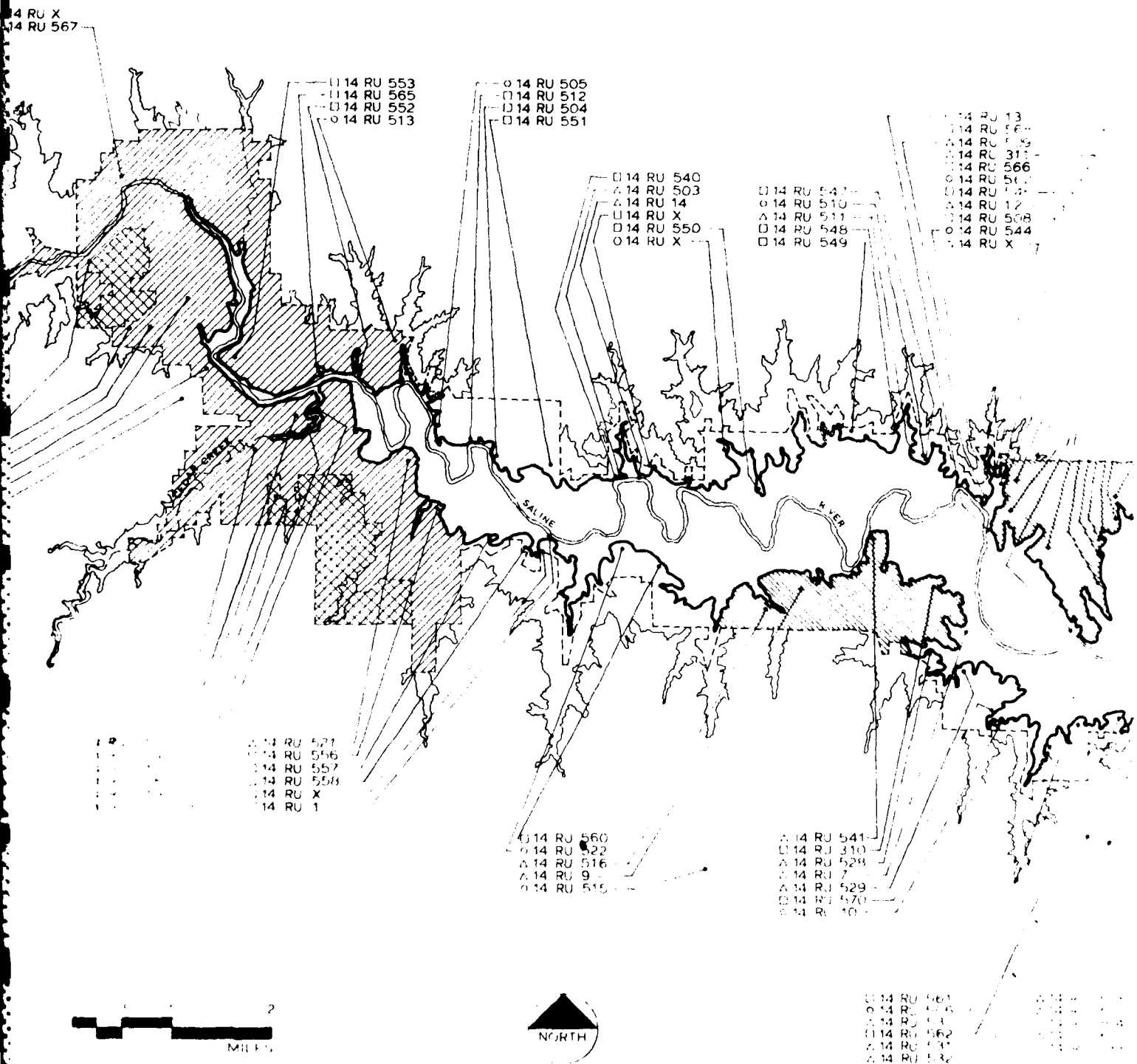


LEGEND

- △ PREHISTORIC SITE
- HISTORIC SITE
- PREHISTORIC / HISTORIC SITE
- NATURAL FEATURE
- ~~~~~ RESERVOIR BOUNDARY (1582 F.T. CONTOUR)
- ~~~~~ POOL CONSERVATION LEVEL (1516 F.T. CONTOUR)
- BOUNDARY OF PROJECT LAND
- [XXXX] PUBLIC USE AREAS
- [XXXX] WILDLIFE MANAGEMENT
- [XXXX] RS FORESTRY FISH AND GAME COMM

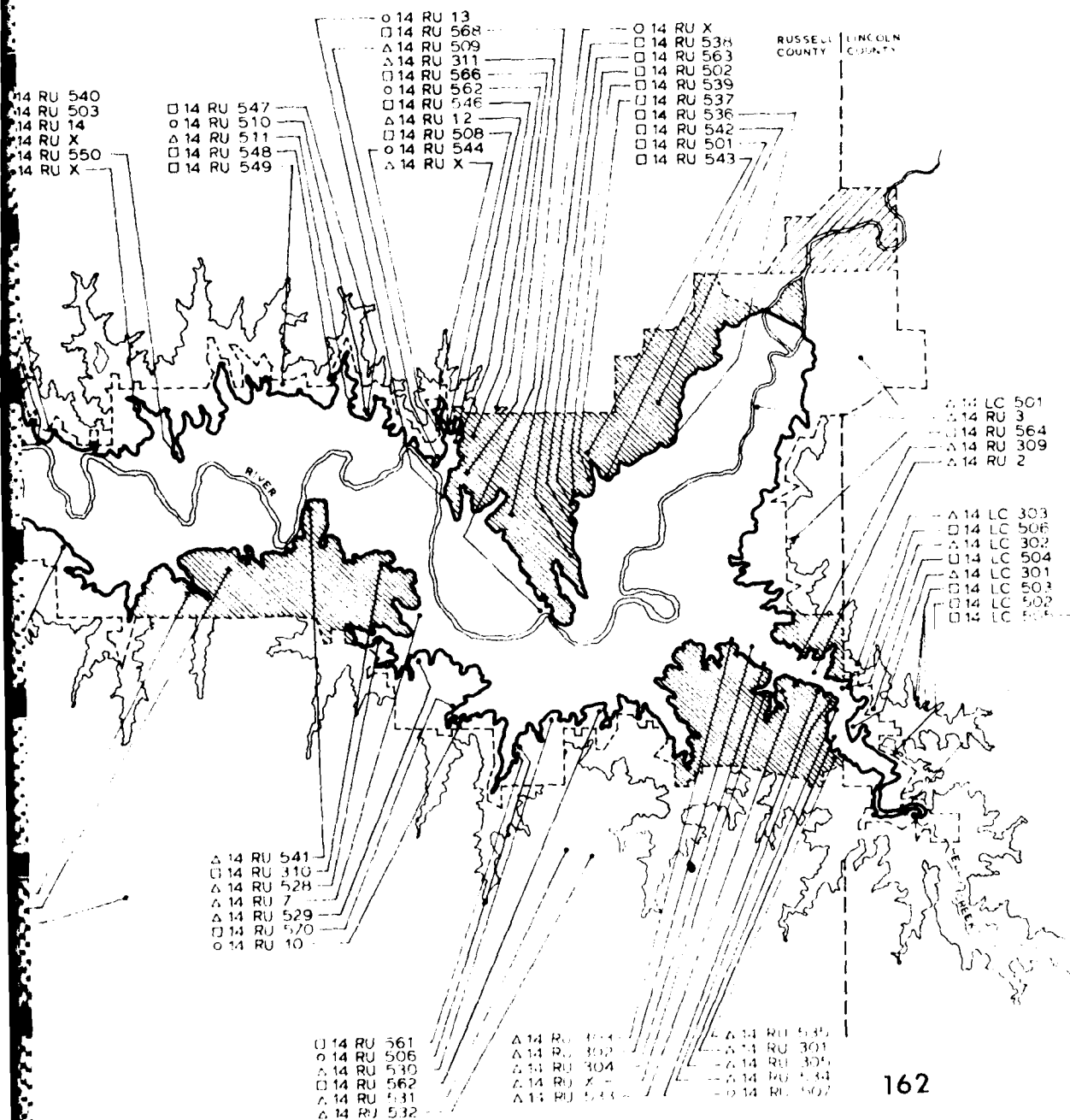


SITE LOCATIONS AT WILSON RESERV



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VII.

RESULTS: SITE DESCRIPTIONS

The following section provides a summary of all of the sites found during this and previous surveys. The descriptions all follow the same format. Two (or more) site numbers are given. The first is the Smithsonian trinomial designation, i.e., the official site number. The second, in parentheses, is the temporary designation given during the 1985 field survey. The latter will allow future professional investigators to tie the summaries given here to the field notes kept during the survey.

A brief description of each site is then given. This includes its general location, size, type, and description of testing, if any. The collection made at each site is then described, an evaluation of the site is discussed and recommendations are made. The descriptions are in numerical order, with the Lincoln County sites first and those in Russell County second.

Site 14LC301 (B-72) Root Site
Previous Designation: 14RU18

Description:

This site was originally recorded by Solecki and Shippee in 1952, but they mistakenly located it in Russell County and assigned it number 14RU18. The error was corrected by Witty in 1960, and he assigned its current site number. Witty excavated the site in that year and published the results (Witty 1962: 7-31). His excavation uncovered a Smoky Hill Phase house and associated storage pits and artifacts. The site was relocated in 1985, and with some difficulty identified with 14LC301. The 1960 site location map and that of 1952 are both somewhat misleading. There is no question, however, that the site located in 1985 is the same one as recorded earlier.

The 1985 investigation uncovered only three objects, and one of these may not be of cultural origin. The most interesting specimen is a small corner-notched point. It has nearly straight blade edges and a slightly convex ground base. It is of gray Florence chert from the Flint Hills region. The form of point is typical of Early Ceramic period cultures, but all of the material recovered by Witty is consistent with a Middle Ceramic placement. The point may have been picked up and used by Smoky Hill Phase people.

Discovery of the point in the backdirt of a rodent burrow led to an intensive surface investigation combined with probing by shovel and Oakfield coring device. One other specimen, a crude flake scraper, was found in the existing road. A flake

of chert, apparently of road gravel, was found on the far side of the fence from the road. No indication of any subsurface deposits was found.

Recommendations:

The site appears to have been completely excavated. There is little likelihood that further work at the site will yield any valuable information. The site is not eligible for the National Register, and no further work is recommended.

Site 14LC302 Ringneck Site
Previous Designation: 14RU17

Description:

This site was first recorded by Solecki and Shippee in 1952. It was relocated and the site number was corrected by Witty in 1960 (Witty 1962: 57-75). Witty also tested the site, finding Middle Ceramic and Early Ceramic pottery and points in poorly stratified contexts. Bison scapula hoes and a deer mandible sickle are indicative of horticultural activities. Total depth of fill in this small, west-facing rock shelter was four feet. The site was not relocated in 1985, as it is now under water.

Recommendations:

No further work is recommended at this site. It is under water, and Witty's excavations removed almost all of the fill.

Site 14LC303

Description:

This site was found in 1960 by Witty (1962: 54). It consists of two artifacts found on the surface of an outcrop of Dakota sandstone. The objects found include a stemmed point and a broad flat end scraper. An Early Ceramic time period affiliation is likely for the site. Legal description for the site was corrected by John Reynolds in 1970. The site was outside the boundary of the the 1985 survey and was not relocated.

Recommendations:

Witty described the general area around the two finds as barren of other cultural materials. Since both items were found on an exposure of rock utterly devoid of soil and vegetation, the site is best considered as an isolated find spot. Witty's original recommendation for no further work is still appropriate.

Site 14LC501 (B-79)

Description:

This site was reported to the 1985 field crew by a local informant. Local oral traditions say that, when the hilltop near the dam was bulldozed for emplacement of a radio tower, some burials were exposed. No pottery was reported in association, and an Archaic affiliation is therefore assumed. The site is far outside the 1985 survey area and under a standing radio tower. Therefore, no investigation was attempted. The site is on government property.

Recommendations:

The site apparently was destroyed by construction of the tower. We revisited the site in the spring of 1986 and found that what appears to be the remnant of the mound is completely covered by a small building at the base of the radio tower. No work is recommended.

Site 14LC502 (B-73)

Description:

This site consists of several historic petroglyphs incised in a vertical west-facing bluff on the east side of Hell Creek canyon. The inscriptions at the site, from top to bottom, are as follows:

J.E. Puch		
Aug. 18, 1901		
LUCAS		
KAN		
C.H.	E. L. CULLENS	
1873	Aug. 18	
	1901	
	Miss Satie	
	Barnes	
JOs	June 23, 1888	
		HARVEY
		HIGH
		June 23, 1888

Recommendations:

No further work is recommended.

Site 14LC503 (B-80)

Description:

This site consists of a set of rock alignments east of Highway 232. Made from limestone eroding from the caprock, they are located high on the slopes of a minor dry tributary of the Saline River. Three outlines are present. The most recent

and clearest is the word, "America," said by local informants to have been created in 1976 for the celebration of the national Bicentennial.

The earlier and less legible outlines are of a peace symbol and the words "Class of" and "197[illegible]." These relatively recent alignments are already so difficult to decipher that at first the peace symbol was mistaken for a prehistoric alignment. Since these alignments are apt to become even more obscure in the future, a site number was assigned to create a record that will prevent future misintepretations.

Recommendations:

The alignments are on private property. No further work is recommended.

Site 14LC504 (B-71)

Description:

This site, recorded for the first time in 1985, consists of a stone wall, abandoned road, farm equipment, and barbed wire fencing. The abandoned road is bordered by limestone post rock fencing. It runs into the lake to the west-southwest. The stone fence, of dry masonry, now stands from one to two meters high. The longest section of wall, which runs east-west, measures 35 meters. There is an entry in the northern end of a 14 meter long eastern wall. At the western end, the wall turns south for 4 meters, then west for 5 meters. The wall appears to have formed part of an old corral; it contained the same type of weed (kolchia) observed in other abandoned corrals at Wilson Lake.

North of the stone fence are barbed wire fences and an abandoned piece of farm equipment. The latter is a McCormick-Deering Harvester-Thrasher No. 8. The whole complex appears to have formed part of the Glen Root farm. The land on which the site lies was homesteaded in 1882 by Eliza Kies. It was sold by her to Fannie M. Hutchinson in 1907, who sold it to Edward Root later in the same year. It remained in the possession of the Root family until Wilson Lake was created in 1962.

Recommendations:

The rest of the farmstead has been destroyed. This remaining fragment has no integrity. No further work is recommended.

The diagram shows a rectangular field layout. The field is bounded by a 'stone wall' on the right and a 'wire fence' on the top, left, and bottom. A 'McCormick Harvester' is positioned in the center of the field. The field is divided into sections by a vertical line and a horizontal line, with a small rectangular area at the bottom left.

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TABLE 19: OWNERSHIP HISTORY OF 14LC504

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Eliza Kies	5/1882
Witness deed	Eliza Crawford and husband	Fannie Hutchinson	5/1907
Witness deed	F. Hutchinson et al	Edward Root	5/1917
Witness deed	F. Hutchinson guardian	Edward Root	5/1917
Witness Deed	Glen Leroy Root	U.S.A.	7/1962

Site 14LC505 (B-70) Hell Creek Bridge

Description:

This was a masonry two arch bridge at a crossing of Hell Creek by a now-vacated county road. According to Muilenburg and Swineford (1980), this bridge was built as a W.P.A. project in the 1930's. It was known locally as the Hell Creek Bridge. The structure collapsed in a flood subsequent to the field work reported here.

Recommendations:

The bridge is no longer standing. The remains of this structure have little individual merit for inclusion on the National Register of Historic Places. The site is on Corps property.

Site 14LC506 (B-78)

Description:

This is a small single arch bridge of dry masonry. It spans a small easterly tributary of Hell Creek canyon south of the present Hell Creek bridge built across the southern arm of the lake.

Recommendations:

The bridge is on Corps property just outside the 1985 survey boundary. We were not able to find any record of its erection in the county files, but as it is of the same construction as the nearby Hell Creek bridge, it may also have been a W.P.A project. No further work is recommended.

Site 14RU1

Description:

This site was recorded in 1947 by Joseph Bauxar. He described it as a sandstone bluff on the south side of the Saline River, with dated inscriptions of the names of various famous men (Bill Cody, 1853; W. F. Cody, 1863; Wild Bill Hickok, 1875). He suggested testing of the terraces below the site. This was never done. The site is now inundated, and nothing could be seen in 1985.

Recommendations:

If the autograph petroglyphs were real, this site would have considerable significance. There is no indication, however, that these men were in the region during the times specified, and the 1853 date is highly suspect. The

petroglyphs are probably forgeries. Forged "Indian" petroglyphs and forged early dates were recognized at other spots during the 1985 survey. They are unfortunately common.

Site 14RU2

Other Designations: (14RU305?)

Description:

This site consists of petroglyphs on a sandstone bluff and cultural material in a terrace deposit. It was located in 1947 by Joe Bauxar and W. L. Bliss. They recommended photographing the petroglyphs, investigating caves reported to them and testing of the terrace deposits. The landowner's wife reported "Indian material" on the terrace, and another collector reported finding projectile points here. The surveyors noted seeing some burned bone eroding from two feet below the surface of the terrace in 1947.

The location map for the site is vague. If one follows the course of the stream as Bauxar and Bliss drew it, it would be located about half a mile from where their (unlabelled) section lines appear to have it. If one trusts the section lines, then this site is probably the same as 14RU305. The descriptions of the two sites are very similar, but not identical. Therefore, we do not propose listing them as a single site.

Recommendations:

Whatever the original location and identity of the site, it is now under water. If it is the site tested by Witty, it has little potential for further work. No further work can be recommended at this time.

Site 14RU3

Description:

This site was recorded by Bauxar and Bliss in 1947. They recorded cultural material, charcoal and animal bones, eroding from a high alluvial terrace on the south (right) bank of the Saline River. They recommended testing of the site, but this was never accomplished. The reason may have been because the site was mislocated. The location map is quite vague, and the features drawn are somewhat at variance with the legal description.

Recommendations:

The site is now inundated, and the site location is too vague to even recommend re-examination should the reservoir be drawn down. No further work is recommended.

Site 14RU7

Description:

This small site on a high piece of ground next to a spring-fed stream was recorded by Solecki and Shippee in 1952. They reported that the landowner had collected pottery, projectile points, an end scraper, ocher, and retouched flakes from the site. The descriptions are consistent with, but do not positively identify, a Smoky Hill Phase component. They recommended testing of the site, but this was not accomplished.

Recommendations:

The site is now inundated. It would be appropriate to test this site if the lake were ever to be drawn down temporarily. Shippee's map and verbal description should allow fairly easy identification of the spot.

Site 14RU10 (B-85) Circle Rock

Description:

This petroglyph appears to have been recorded initially by J. R. Mead. A notebook containing his drawings of petroglyphs at the site is in the possession of Mrs. Ignace Jones of Wichita. The family will not permit publication of the drawings until it is determined whether any members of the family who are anthropologists (there are three of these) might want to publish this material. Mead recorded the petroglyphs on July 24, 1892, at which time he noted considerable defacement of the aboriginal petroglyphs by cowboys and other visitors.

Mead's description of the site, a concave sandstone bluff with a spring issuing from the base, fits the description of the site by Solecki and Shippee in 1952. His notes indicate that paint still adhered to some of the aboriginal petroglyphs.

Solecki and Shippee took 20 photographs of the site, the negatives for which are now in the Smithsonian Institution. They recommended testing of the terrace deposits at the cliff base, but this was never done.

The site is now partially inundated. The terrace and spring are now underwater, but some of the petroglyphs are above the water line. The site could not be seen from land, and a boat had to be used to view it.

Recommendations:

This site is already listed on the National Register. It is subject to erosion from which it cannot be protected. Any mitigation will have to take the form of photographs and/or

scale drawings of the remaining petroglyphs.

Site 14RU12

Description:

This site, recorded by Solecki and Shippee, consists of two prominent sandstone columns about 20 feet high. Petroglyphs were noted on the west and south faces of one of them. A corner-notched point was found on the terrace surface at a point where the creek met the Saline River. This, apparently was about one-third of a mile southwest of the rocks.

Recommendations:

The site is now inundated. If the water level is ever lowered sufficiently, the rock should be examined to see if any petroglyphs survived. At the same time, the terrace where the creek joined the Saline River should be examined for buried sites. This is very close to where the Pawnee trail (shown on Shippee's map) crossed the Saline River.

Site 14RU13

Description:

This petroglyph site contained human figures and other designs, partly obscured by the carving of later names. It was recorded by Ralph Solecki in 1952. It is now under the waters of Wilson Lake. Solecki took pictures of the petroglyphs; the negatives are now stored at the Smithsonian Institution.

Recommendations:

The site is near the crossing of the Saline River by the Pawnee trail. If the waters of the lake should ever be lowered, the site should be re-investigated.

Site 14RU14

Description:

This village site had been potted somewhat by youngsters of the Duvall family prior to the Solecki and Shippee survey of 1951. The site is described as covering at least half an acre on a grassy terrace on the north (left) bank of the Saline River. A well-defined hearth was seen eroding from a cut bank one foot below the surface. Solecki and Shippee collected one triangular point, flint chips, and some pieces of animal bone.

The point type is common in the Late Ceramic period but is

also found in sites of the Middle Ceramic period. Specimens in the Duvall family collection that were drawn by Solecki and Shippee indicate the presence of at least two components, one from each of these periods. The same drawings are also included in Solecki and Shippee's reports for sites 14RU15 and 14RU16. The specimens thus cannot be attributed to an individual site. The Late Ceramic period is indicated by a fragmentary red stone pipe of Great Bend Aspect style. A Middle Ceramic component, probably of the Smoky Hill Phase, is represented by flaring cord-roughened rim sherds and by a plain-faced collared rim with a pinched base.

Recommendations:

It is unfortunate that this site was never tested. It may contain a Great Bend component. The site is now inundated. Should the water level of Wilson Lake ever be lowered to the point where it is exposed again, this site should be given a high priority for testing.

Site 14RU15. See entry for 14RU505.

Site 14RU16. See entry for Site 14RU505.

Site 14RU17. See entry for Site 14LC302.

Site 14RU18. See entry for Site 14LC301.

Site 14RU301

Description:

This site was recorded by Witty (1962: 55-56) in 1960. It consisted of a hearth exposed ten feet below the surface in a cut bank of Hell Creek. The cultural deposit was associated with the lower of two paleosols in the exposure, and cultural material was observed over a sixty-foot stretch of the bank. Witty collected two calcite-tempered body sherds from tests in the site and observed some small fragments of animal bone and flecks of charcoal. The site is presumably of the Early Ceramic period, probably Keith Focus. The existence of Middle Ceramic materials in a higher paleosol at the nearby site, 14RU302, supports this inference. Its deep burial fits with the geomorphological evidence collected in 1985.

Recommendations:

The site is inundated. No further work is recommended.

Site 14RU302

Description:

This site was found by Witty in 1960 at the point where the valley of Hell Creek merges with that of the Saline River (Witty 1962: 57-75). He reported cultural material scattered thinly over 20 acres. Tests at the site indicated the presence of a paleosol buried 24 inches under brown silt. At least two components were indicated, both in the paleosol, separated vertically by about one foot.

In spite of the large area covered by the site, Witty called it a campsite rather than a village because of the sparse distribution of cultural materials. The cultural materials recovered, including sand-tempered pottery, a bent tubular pipe, and a polished celt, are consistent with a Central Plains Tradition affiliation. Two simple-stamped body sherds belong to the Late Ceramic period. Other components appear to be present as well. Witty (1961:73) concludes that there are a minimum of three. The site location, at the mouth of a protected side valley with a spring-fed stream and adjacent to the Pawnee Trail, is sufficient to explain the existence of a large multi-component campsite.

Recommendations:

The site is now inundated. If the lake is ever drawn down temporarily, an intensive survey of the surface materials should be made. Because of the sparse distribution of materials, however, it is not likely that excavation would be profitable.

Site 14RU303

Description:

This site was discovered and excavated by Witty in 1960 (Witty 1962: 76-86). It lay at the edge of a high bluff on the south side of the Saline River valley. The cultural material was all close to the surface, as the soil on the terrace is quite thin -- about one-foot deep. Witty's test excavations uncovered twelve shallow pits and randomly scattered post molds. Cultural material found included pottery, end scrapers, and a bone awl. The pottery is indicative of Central Plains Tradition and Plains Woodland components but is not diagnostic of particular phases within these units. The cultural material was not dense enough to suggest a permanent settlement, and Witty called it a "camp or village."

Recommendations:

The site area was resurveyed in 1985, but nothing was found. Shoreline erosion has apparently destroyed the site completely. No further work is recommended.

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ALONG THE PANNEE TRAIL: CULTURAL RESOURCE SURVEY AND
TESTING AT WILSON LAKE KANSAS(U) BLAKESLEE (DONALD J)
WICHITA KS D J BLAKESLEE ET AL. AUG 86

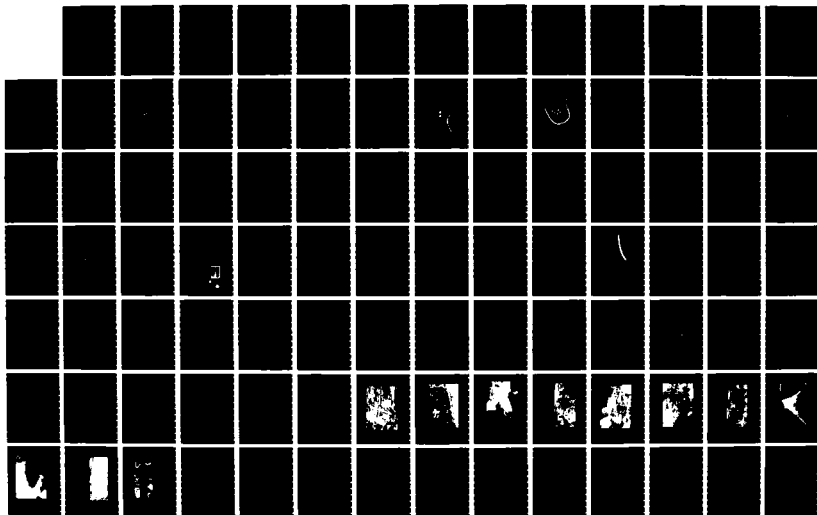
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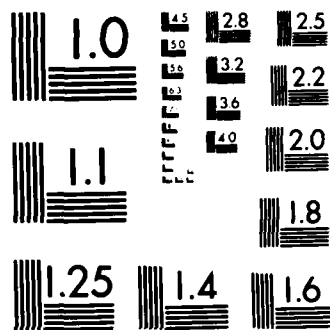
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Site 14RU304

Description:

This site consisted of a series of petroglyphs on a sandstone bluff when it was recorded by Witty in 1960 (Witty 1962: 87-88). He took 11 photographs of the site, which are curated at the Kansas State Historical Society. A recurring motif at this site is a square with a dot or bar inside it. He also found horse and rider and tipi motifs. All are found at other sites at Wilson Lake.

Recommendations:

The aboriginal petroglyphs are now inundated. If the water level should every be lowered temporarily, the site should be examined to assess the damage to the petroglyphs caused by inundation. Witty's 1960 photographs could be used as a baseline for such a study.

Site 14RU305

Description:

This site consists of a small cave with associated petroglyphs and a low wall of rocks at the cave entrance. It was discovered and tested by Witty in 1960, but was not included in his report of findings (Witty 1962). In 1962, a pothunter's pit was visible in the center of the floor of the cave. Witty's test excavation uncovered only some flecks of charcoal and small pieces of burned animal bone. No culturally diagnostic material was recovered.

Recommendations:

The site is now inundated. Witty's photographs of the petroglyphs are at the Kansas State Historical Society. No further investigation of the site is warranted.

Site 14RU309

Description:

This is a paleontological site, consisting of fragments of mammal bone eroding from cut bank on the shore of Wilson Lake. It was recorded in 1979 by Rowilson (1982: 40). The site was revisited in 1985, and a few more sections of animal bone were found in the gravel. They appear to be associated with the gravel deposit and are heavily water-worn. This probably occurred prior to deposition of the gravel.

Recommendations:

It is very unlikely that information of any value will be forthcoming from this site. The animal bones appear to have been washed far from their point of origin by natural processes in the distant past. All are broken, water tumbled, and undiagnostic. No further work is recommended.

Site 14RU310 (B-62), The William Justus Site

Description:

This site consists of an historic dugout with associated dry masonry walls. It was originally recorded by Don Rowliston in 1976. He recorded a scapula of a large animal (cow or bison) on the ground surface nearby, but no other artifacts (Rowliston 1982: 40-41).

The site was relocated in 1985, when some sun-discolored glass sherds were recorded on the opposite side of the ravine. The structure was recorded as 4 by 13.6 meters (as proposed to 3 by 6 meters recorded by Rowliston). The reason for this discrepancy is unknown. The site map on the original site survey form makes it clear that this is the same site. The site was visited a second time to recheck our measurements, and they proved to be correct. The coursed sandstone walls were recorded on the long walls but not the front (which abuts the ravine to the east-southeast).

The dugout was probably created by the homesteader on this piece of land, William Justus. Table 20 lists the ownership history of the property.

Recommendations:

This site is in a public use area and close to a boat ramp. There is thus some potential for vandalism by relic and bottle collectors. Small hackberry trees growing in the depression will help to inhibit damage, as they will make digging difficult.

This site has moderate potential for yielding information about the early historic occupation of the region. The most likely trash-disposal areas for the occupants of the dugout are now under water, however, limiting that potential severely. It is therefore not likely to be eligible for the National Register.

Site 14RU311

Description:

This site consists of a rock-filled mound on the north

TABLE 20: OWNERSHIP HISTORY OF 14RU310

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	William Justus	5/1884
Witness Deed	William Justus	A.B.Ruppenthal	7/1897
Sheriff's deed		John Hancock Mutual	5/1933
Witness deed	John Hancock	Roy Shaffer	10/1941
Witness deed	Roy Shaffer	Ollie Rippenthal	3/1945
Witness deed	Ollie Rippenthal	D.J. Marshall	3/1945
Witness deed	D.J. Marshall	Ray Antrim et al	10/1954
Witness deed	Ray Antrim et al	Rusco, Inc.	11/1962
Witness deed	Rusco, Inc.	U.S.A.	12/1962

(left) side of the Saline River. It is located at the end of a ridge on the east side of a side valley. The mound was discovered and recorded by Rowlison in 1979 (Rowlison 1982: 41).

This appears to be a burial mound, as it is significantly larger (10 meters in diameter) than the cairns around the lake. It was revisited and photographed in 1985. The site lies just east of the Pawnee trail and probably represents the burial of one or more travellers along the trail. It is the only burial mound at Wilson Lake found at such a low elevation; all of the others are at the ends of high ridges or hills. This suggests, but does not demonstrate, that its association with the trail is more than coincidental.

Recommendations:

Nothing on the surface of the ground was indicative of the age or cultural affiliation of the site. No testing was done in 1985 because the site lies outside the survey area. further, testing is likely to be too destructive for the amount of information that is likely to be recovered. When a thematic nomination is made to the National Register of sites associated with the Pawnee Trail, this site should be included. It is located in a fairly remote area and is not threatened at present.

Site 14RU501 (B-3)

Description:

This site consists of historic petroglyphs carved on a rock face at the edge of the lake in the Lucas Park area. The age of one of the petroglyphs led us to record the site. The inscription is:

Westinger 1909

Recommendations:

The site has been drawn and photographed. It is in a high use area, where many new petroglyphs are being carved. There is no feasible way to protect it, and now that it has been recorded, no particular reason to do so. No further work is required.

Site 14RU502 (B-5)

Description:

This site consists of a stack of seven limestone fenceposts. It is on the north shore of the lake in a public use area. These posts and those at 14RU536, 14RU537, and

14RU538 represent posts purchased from one of the quarries in the region and stored at convenient spots on ranches for use in fence repair. As such, they represent part of a significant historic cultural adaptation to this environment.

Recommendations:

Eventually, someone with a pickup truck is going to steal these posts. They are readily visible and in a high-use area. If there is any reasonable use to which the posts might be put at the lake headquarters or in one of the recreation areas, they should be so used. There is no feasible way to protect them in their current location. When this is done, the Department of Historic Preservation at the Kansas State Historical Society should be informed.

Site 14RU503 (B-20)

Description:

This site, found in 1985, consists of a set of apparently prehistoric petroglyphs. It is located on the north shore of Wilson Lake.

The petroglyphs include three sets of four short parallel lines, two sets of two parallel lines (one short and one long set), an X, several intersecting lines, three small depressions and a deep depression with ten radiating grooves and two parallel incised lines between each groove.

Recommendations:

This and all of the other petroglyph sites at Wilson Lake should be recorded with photography. Individually, they have only moderate significance. As a group, however, the significance would be high and the potential for public interpretation at the visitor's center would be very high. Complete survey of all of the rock walls on Corps land should be made prior to the photographic recording.

Site 14RU504 (B-23)

Description:

This site, found during the 1985 survey, consists of two sections of sandstone wall on one slope of a ravine on the north side of Wilson Lake. The walls are simple stacks of naturally shaped stones. The northernmost is straight, 3 meters long. The southerly wall is in the form of an arc, 25 meters long.

We can formulate no reasonable hypothesis for the function of these walls. They do not define a structure and they are

not properly located nor substantial enough to be a bison trap. There is nothing at the site to indicate cultural affiliation.

Recommendations:

No further work is recommended.

Site 14RU505 (B-26)

Previous Designations: 14RU15 and 14RU16

Description:

This site consists of a series of small caves and associated petroglyphs in a canyon on the north side of Wilson Lake. It appears to have been recorded originally by Solecki and Shippee as two sites. If so, their locations for the sites are incorrect, placing them too far south. Since the spot they recorded is now inundated, there was no way to determine whether this is definitely the same site. Therefore, a new site number was assigned.

They report the cave fill as having been disturbed by cowboys. They also report some materials from the caves in the possession of the Duvall family. Their drawings of these artifacts include rimsherds, a pipe fragment and a triangular point. The same drawings are included in their report of Site 14RU414. Apparently, the Duvall boys did not keep track of which site their material came from. Solecki and Shippee collected one body sherd, three flakes, and five animal bone fragments from pothunters backdirt in one of the caves. One bone was identified as a deer or antelope astragalus, another is a fragment of a turtle carapce.

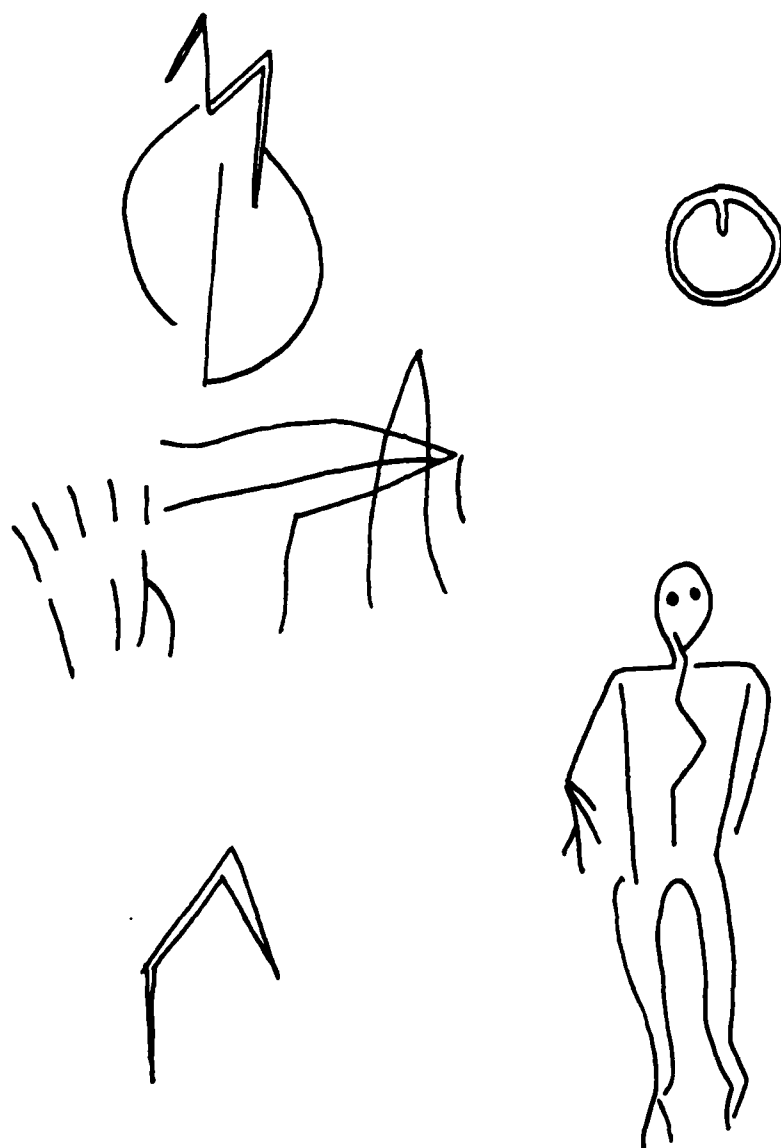
In 1985, the site was re-recorded as a series of seven small rockshelters and caves (assigned letters A through G) along both walls of a small ravine. No sign of undisturbed fill remained in the caves or outside them. A series of historic and prehistoric petroglyphs were recorded in the ravine; these were drawn and photographed. Early historic names and dates include:

S T Heller	1877
THO. W.	1877
Earl Hollman	MAR. 3. 1907
MAHON	1917

Several of the more readily decipherable prehistoric petroglyphs are shown in Fig. 22.

Recommendations:

The petroglyphs here and at other sites at Wilson Lake should be recorded by photography. They are endangered by current visitors.



PETROGLYPHS AT 14RU505

Figure 22

Site 14RU506 (B-58)

Description:

This site consists of two apparently prehistoric petroglyphs and one historic petroglyph. The site is located on a northwest facing bluff on the south side of Wilson Lake.

The two prehistoric petroglyphs are zoomorphic, showing profile views of two running animals. Neither is identifiable as to species. The historic petroglyph has the appearance of a brand or monogram. It is made up of the co-joined letters, W and E.

Recommendations:

A permanent record of the petroglyphs should be made by photography. This should follow a survey of all of the government property so that all of the petroglyph sites will be recorded.

Site 14RU507 (B-86)

Description:

This site was found in 1985 during the boat survey. It contains both historic and prehistoric petroglyphs. It is located just south of the Hell Creek bridge on a east-facing rock wall just above the lake's water line. The historic petroglyphs consist of two pairs of initials and corresponding dates of 1881 and 1883. Below this there was a clear handprint and some faint lines which could be of other handprint carvings.

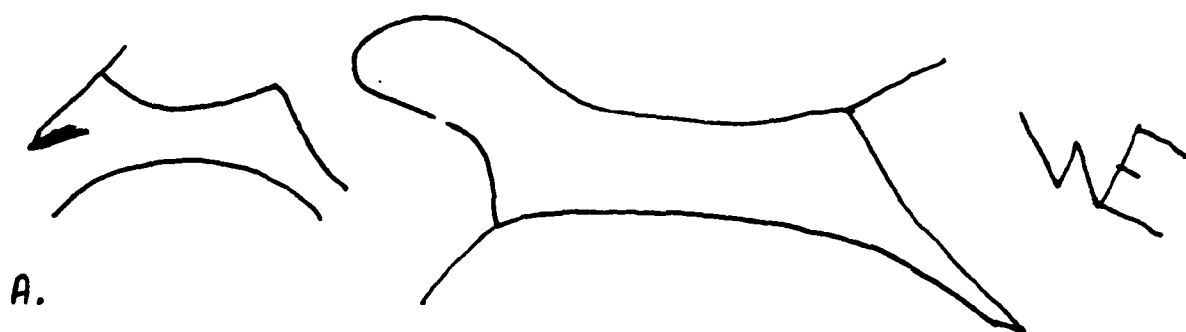
Recommendations:

These petroglyphs should be recorded photographically, along with all of the others at Wilson Lake.

Site 14RU508 (B-10)

Description:

This site, found in 1985, consists of an historic building foundation. The foundation is of poured concrete, seven meters square. The eastern wall is about 10 cm lower than the other three, and this presumably defines the front of the structure. It faces east into what is now a small arm of the north shore of Wilson Lake. No cultural material was observed on the surface, which supports a heavy growth of vegetation. The building was on the Cooper Ranch.



A. PETROGLYPHS AT 14RU506

B. PETROGLYPHS AT 14RU516

Figure 23

Recommendations:

No further work is recommended.

Site 14 RU509 (B-13)

Description:

This site was found in 1985. It consists of a few petroglyphs on an east-facing rock overhang. Three sets of petroglyphs were found. The southernmost consists of a rainbow-like arch and a tipi; the second of a diamond with a dot in the center and four parallel lines, and the northernmost of a tipi and a faint object that may be another tipi and two diagonal lines.

Recommendations:

These petroglyphs should be recorded photographically, along with all of the others at Wilson Lake.

Site 14RU510 (B-14)

Description:

This site, found in 1985, contains both prehistoric and historic petroglyphs. It is on a south-facing rock wall on the north shore of Wilson Lake. It includes two turkey tracks, each with a vertical line beside it. The lines are to the left of the upper turkey track and to the right of the lower one.

Recommendations:

The prehistoric petroglyphs should be photographically recorded. They are threatened by erosion. No other work is required.

Site 14RU511 (B-15)

Description:

This site consists of two petroglyphs on a west-facing cliff on the north shore of Wilson Lake. It is in a well-protected position behind trees and currant bushes. The two figures incised into the rock appear to be a human and an animal (perhaps a horse and rider). They are superimposed on some natural cracks, and it is difficult to determine what is natural and what is artificial.

Recommendations:

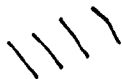
The petroglyphs should be recorded photographically.

TABLE 21: OWNERSHIP HISTORY FOR 14RU508

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	A.G.T. Cooper	11/1886
Tax Deed	A.G.T. Cooper	J. Melvin Adams	9/1890
Witness deed	J. Melvin Adams	S.B. Farrell	11/1898
Witness deed	S.B. Farrell	A.G.T. Cooper	2/1900
Witness deed	Nellie P. Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Cecil F. Cooper	2/1930
Witness deed	Cecil F. Cooper	Emmett Cooper	9/1935
Witness deed	Emmett Cooper	Fred W. Heine	3/1950
Witness deed	Fred W. Heine	U.S.A.	3/1962



NORTHERN SET



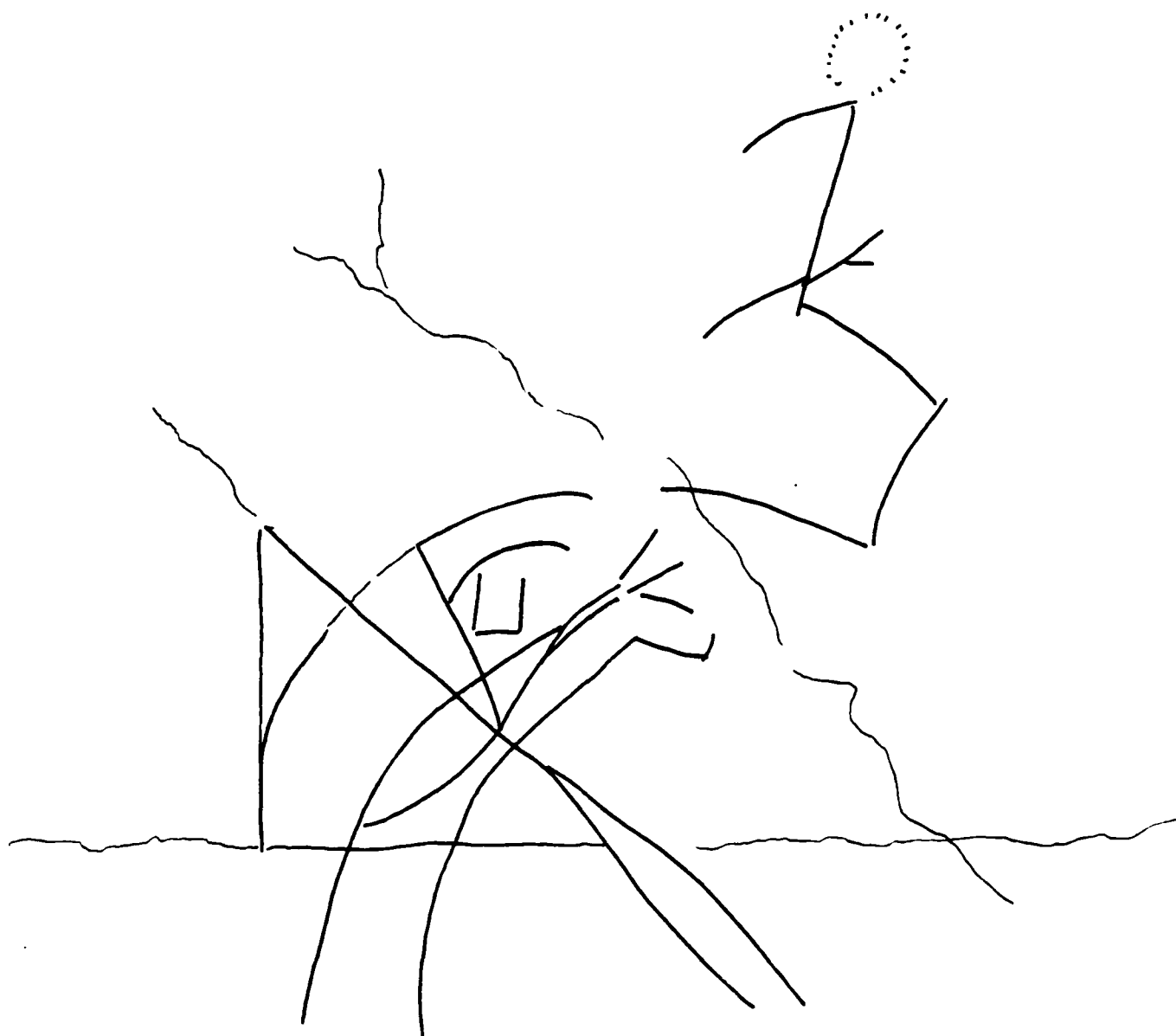
CENTRAL SET



SOUTHERN SET

PETROGLYPHS AT 14RU509

Figure 24



PETROGLYPHS AT 14RU511

Figure 25

No other work is required.

Site 14RU512 (B-27)

Description:

This site consists of three historic petroglyphs on a south-facing rock wall on the north shore of Wilson Lake. One of the dates cannot be deciphered. The inscriptions are as follows:

THOMAS W., 2M, 1879
END APRIL, 1941
MAN 1, 4..4 (indecipherable)

Recommendations:

No work need be done at this site.

Site 14RU513 (B-25)

Description:

This petroglyph site on the north side of Wilson Lake includes both prehistoric and historic carvings. The prehistoric figures include two horsemen in different styles. One carries a shield. There is also a deep cup-shaped depression that may be a petroglyph. The historic carvings include:

HI FRANK
CC SAVY 1962
r.t.
10

Recommendations:

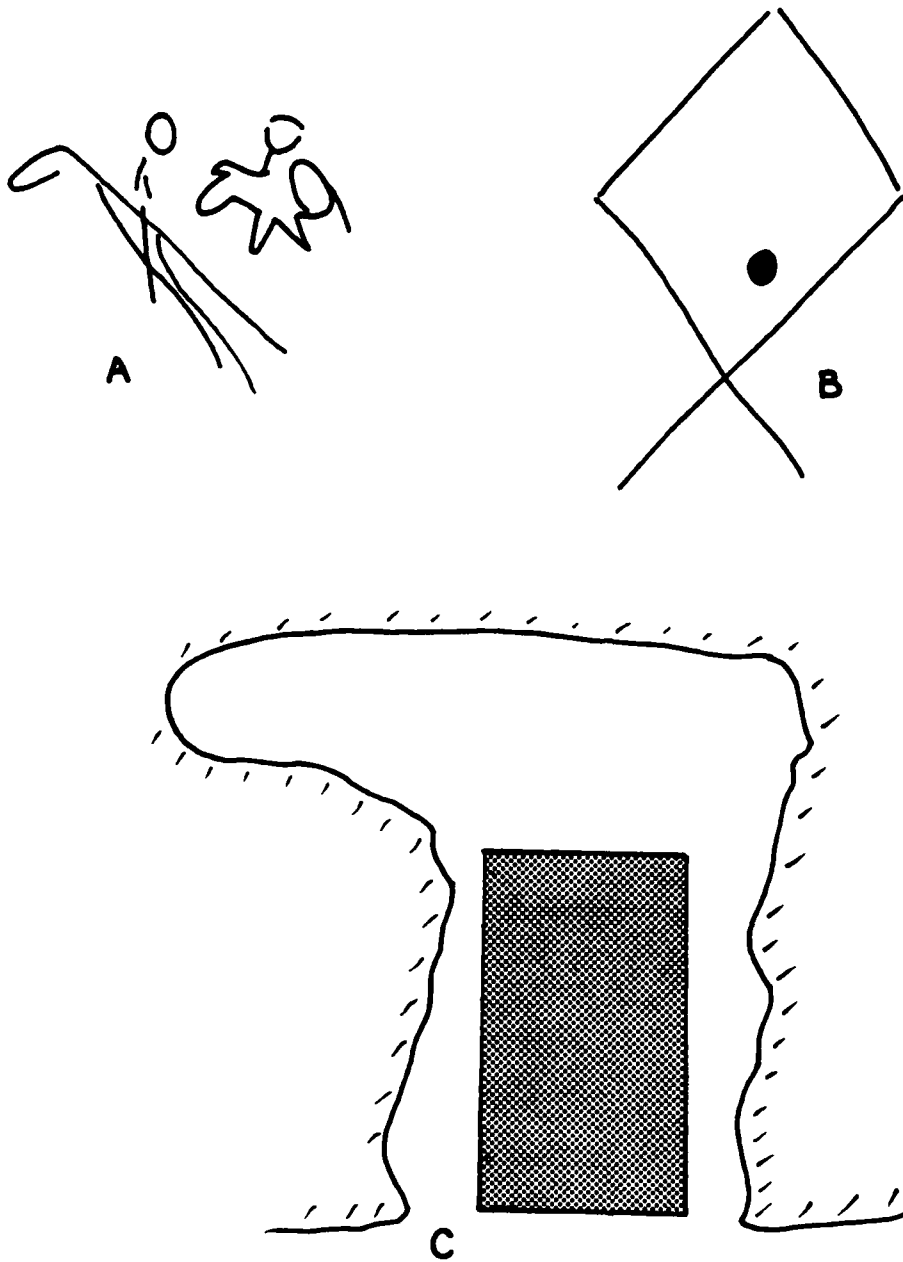
The prehistoric petroglyphs should be recorded photographically.

Site 14RU514 (B-35, B-36)

Description:

This site is a small cave that contains a few prehistoric petroglyphs and many very recent ones. It is located on the north shore of the lake. The cave faces west, and there is a small seep to the northeast.

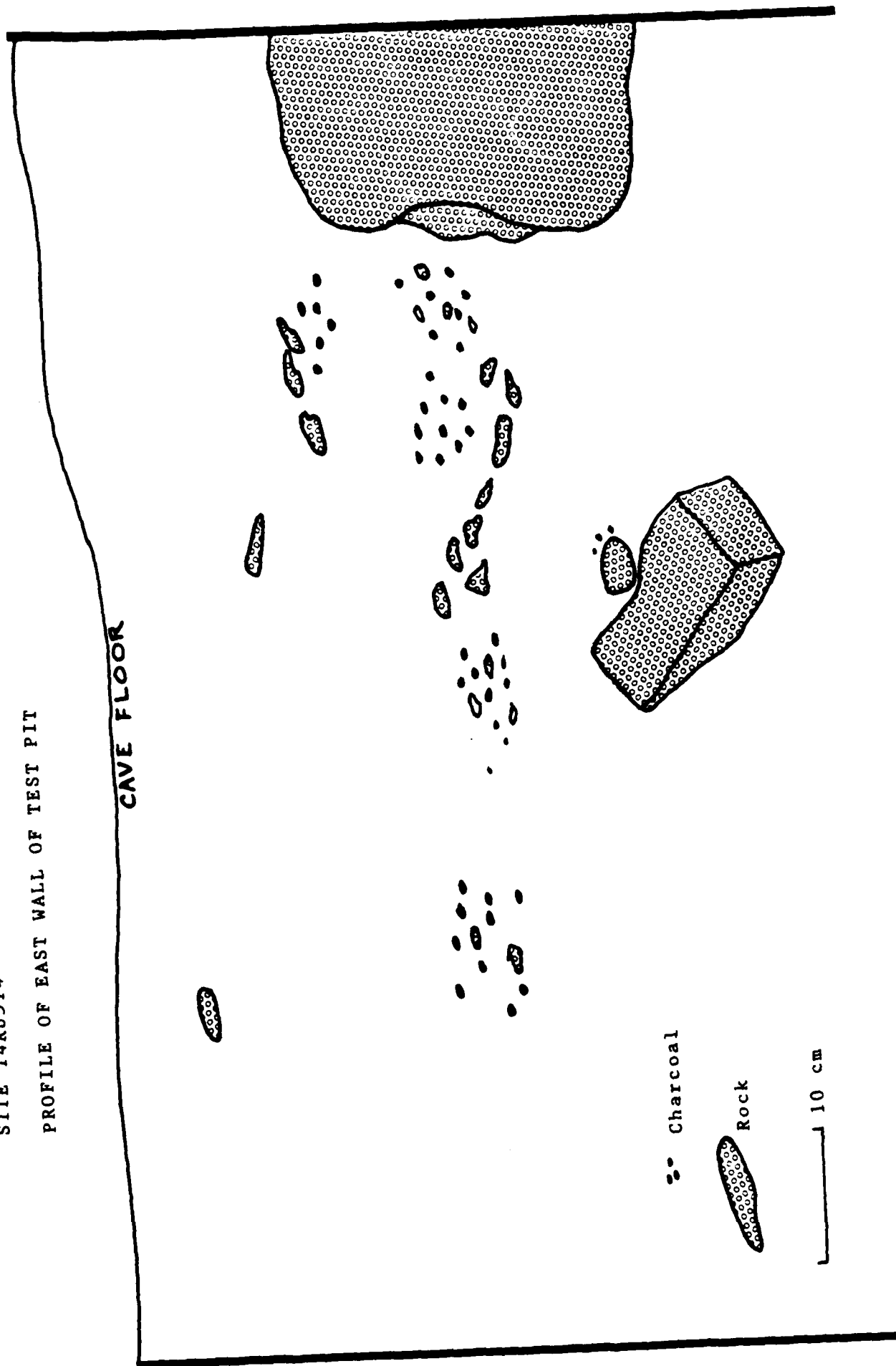
The prehistoric petroglyphs in the cave are quite faint. On the right hand wall as one enters is a geometric figure like a diamond with two legs. There is an off-center dot .pa



- A. PETROGLYPHS AT 14RU513
- B. PETROGLYPH AT 14RU514
- C. LOCATION OF TEST PIT, 14RU514

Figure 26

Figure 27
 SITE 14RU514
 PROFILE OF EAST WALL OF TEST PIT



inside the diamond. Nearby is an irregular, apparently incised line with two other lines crossing it. On the left hand wall are two vaguely triangular figures, both very faint.

Testing:

The floor of the cave showed signs of some pothunting, but a probe with the Oakfield coring device showed some charcoal at a depth of 20 cm. A one by two meter test pit was placed lengthwise down the center of the cave, taking up most of the cave floor. This was excavated in 10 cm levels to a depth of 58 cm below the surface, where the bedrock was encountered. All of the fill was sifted through window screen mesh. No clear strata could be defined in the very fine-grained fill.

At a depth of from 12 to 32 cm below surface, a very poorly defined hearth was encountered. It consisted of scattered pieces of charcoal and small fire-reddened fragments of sandstone and limestone. Charcoal from this deposit was submitted to Beta Analytic for radiocarbon analysis, and a date of 960±60 years B.P. (Beta - 14137) was obtained. This provides a guide to the rate of deposition within caves of this sort (2.3 cm per century) and also indicates a likely age for the faint petroglyphs on the cave walls.

The only prehistoric artifact found was a single small flake of Smoky Hill jasper, encountered at 32 cm below surface. A small mussel shell fragment and two small pieces of animal bone (one calcined) may also belong to the same component. Also found were two historic artifacts, the lead from a 32 caliber bullet and a small brass grommet. The bullet was found between 28 and 38 cm below the surface; hence a good deal of mixing had occurred.

Recommendations:

The single test pit occupied most of the cave. There is little likelihood of any significant material in the remainder of the deposit. No further excavation is recommended. An attempt should be made to record the petroglyphs photographically before they are destroyed by visitors.

Site 14RU515 (B-82)

Description:

This site consists of a large set of petroglyphs in a narrow canyon south of Wilson Lake. Most of the visible petroglyphs are historic, but a few Native American petroglyphs are faintly visible. Representative dates on the historic petroglyphs range from 1877 to 1959.

Recommendations:

One branch of the Pawnee trail probably led down this canyon. Both the Native American and early historic petroglyphs have some significance in the framework of a study of all of the petroglyphs at Wilson Lake.

Site 14RU516 (B-55)

Description:

This site is a small cave in a north-east facing cliff on the south shore of Wilson Lake. The floor of the cave contains no cultural materials, but there are a few petroglyphs on the back wall of the cave (Fig. 23b). Shown are a zoomorphic figure and several sets of intersecting lines.

Recommendations:

The petroglyphs should be recorded photographically as part of a project to document all of the petroglyphs at Wilson Lake.

Site 14RU517 (B-65)

Description:

This site consists of a small cave and petroglyphs in a narrow canyon south of Wilson Lake. The canyon is probably the one described by Charles Augustus Murray in 1836. It forms part of the Pawnee trail. Petroglyphs include historic names, brands, and inscriptions as well as Native American petroglyphs such as a hand and a bear paw. Testing in the cave indicated that only a thin layer of sand is present, but flecks of charcoal indicate the former presence of a fire.

Recommendations:

This site has potential significance for both the petroglyphs and the association to the Pawnee trail. Nomination to the National Register should be made in the context of a large scale investigation of either of these phenomena.

Site 14RU518 (B-42)

Description:

This site is a small cave on Cedar Creek. The cave has two openings, each about a meter wide and 1.5 to 2.5 meters high. The rock column which separates the two mouths of the cave does not run to the back wall, which is 3 to 4 meters from the entry. There is no cultural material in the scanty floor

fill. Historic petroglyphs adorn the wall. All are of recent vintage. A date of 1879 has obviously been altered from 1979.

Recommendations:

No further work need be done here.

Site 14RU519 (B-40)

Description:

This site is a campsite that was apparently destroyed by road construction. A dirt road cuts across a small knoll near Cedar Creek. Repeated survey of the adjacent plowed field yielded four body sherds, a utilized fragment of petrified wood, and three small bone fragments.

Tests:

In the hope that some of the site might be intact, two test pits were excavated just inside the fence line. Both measured 1 by 2 meters and were placed in line three meters apart. These were excavated into the sterile subsoil, and the fill was screened, but no cultural materials were found.

Artifacts:

The four body sherds are all smooth surfaced. They have buff-colored exterior and interior surfaces and medium gray cores. All could be from a single vessel. All have a very compact paste with fine sand temper. There is nothing truly diagnostic about any of them, but they are reminiscent of Great Bend Aspect pottery.

The single chipped stone artifact is a fragment of low quality petrified wood. Similar material is found in the local gravels. The specimen retains one convex edge that exhibits crude bifacial flaking. The crudeness of the flaking is probably a result of the coarse grain of the stone.

Two of the pieces of bone are fragments of the shaft of a longbone of a large mammal. They exhibit rootlet erosion on the exterior surface. The other piece is a fragment of cancellous bone, also from a large mammal. None of the bone specimens are charred.

Recommendations:

This campsite, perhaps of Great Bend Aspect affiliation, was entirely destroyed by road construction. No further work is recommended.

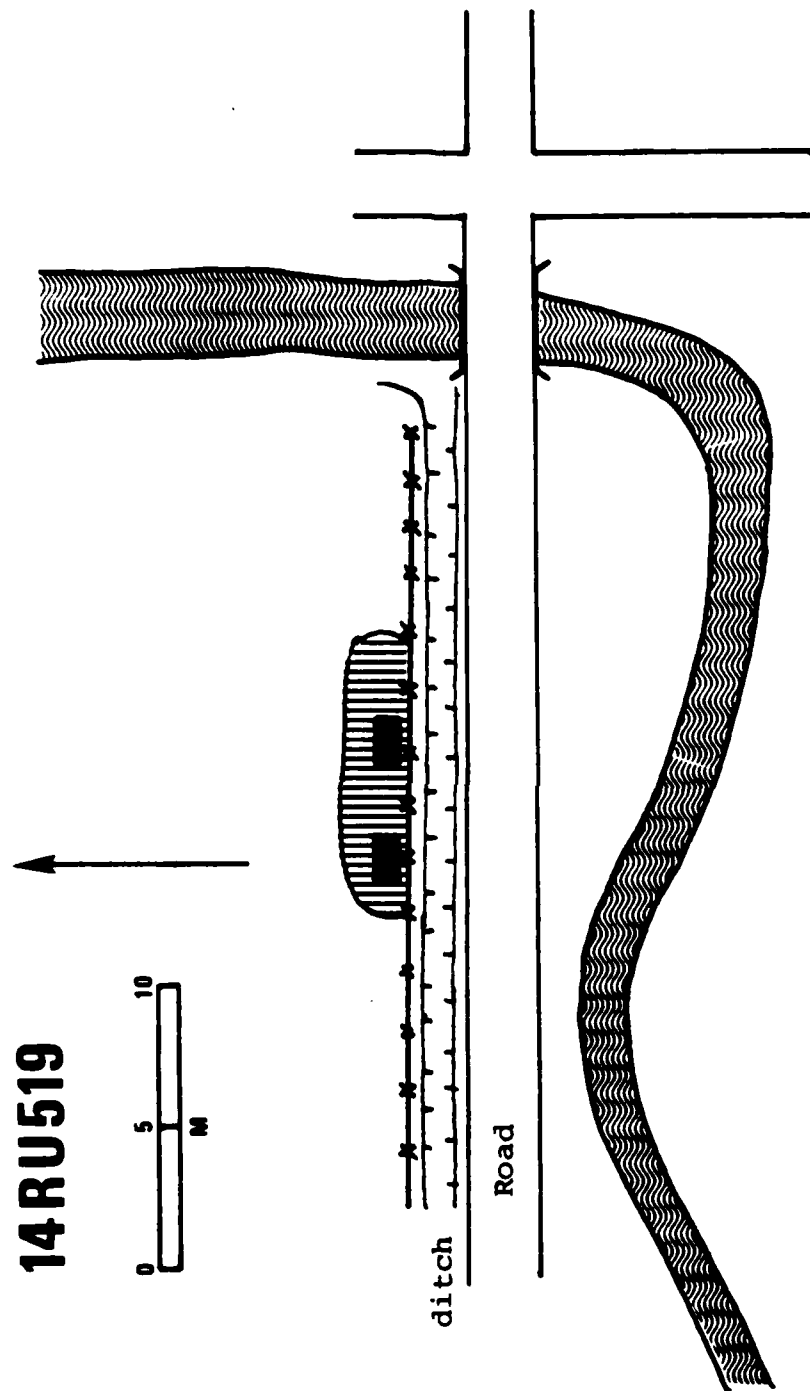


Figure 28

Site 14RU520 (B-45)

Description:

This problematic site lies on a terrace near Cedar Creek. The area has been badly disturbed by road construction and grading. Mixed in with seven apparently natural pieces of gravel in an area measuring 10 by 15 meters, were five flakes that appear to be of human manufacture. One, of Smoky Hill jasper, has a heavy patina on the interior surface and rounded edges, all suggestive of extensive water tumbling. Another flake of jasper appears quite fresh. The other three are of materials not found in the unworked gravel. None of the flakes show any signs of retouch.

Recommendations:

Even if this is a human site, it has been so badly damaged that further work would be fruitless.

Site 14RU521 (B-46)

Description:

This habitation site is located on a rise on an extensive terrace on the south side of Wilson Lake. Repeated surface surveys yielded pottery, scrapers, point fragments, flakes, animal bone, and mussel shell. The surface materials were scattered over an area 20 by 30 meters in extent. The pottery and points are indicative of a Smoky Hill Phase affiliation.

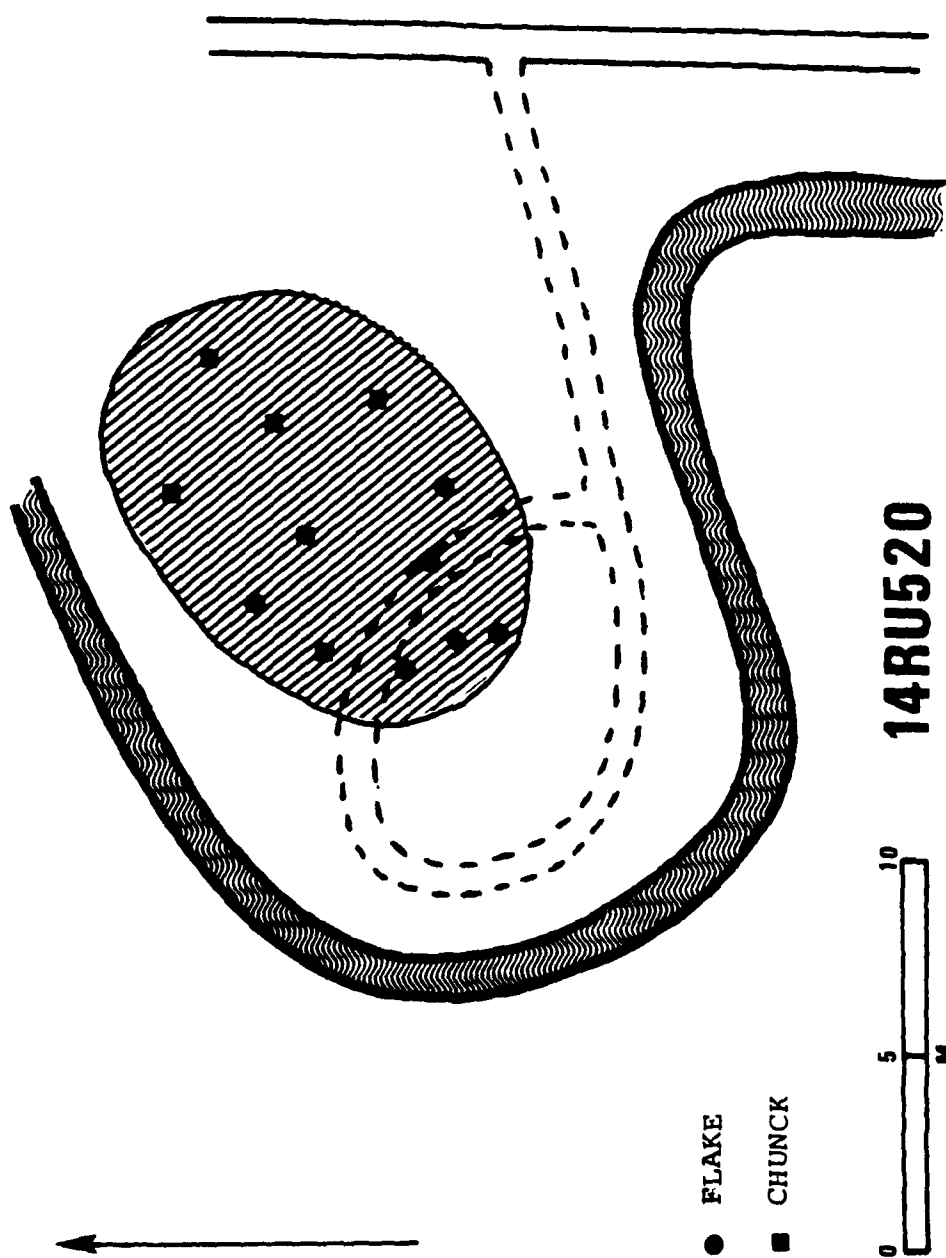
Tests:

Because the amount and variety of the surface materials were suggestive of a habitation site, several test pits were excavated in an attempt to locate features below the plow zone. The test pits were placed in areas where there were concentrations of surface material, but nothing was found below the plow zone. The test pits measured one by two meters and were excavated to a depth of 50 cm below surface. Below a 10-15 cm thick plow zone was a yellowish-brown subsoil totally devoid of cultural material.

The bulk of the material recovered from the test pits was very small. Freezing and thawing may have taken the larger items to the surface. The only material found in the plow zone that was not also recovered from the surface was modern hackberry seed, of which four specimens were found in the two pits.

Materials Collected:

The assemblage recovered from this site is the only one large enough to allow analysis of specimens to determine the



14RU520

Figure 29

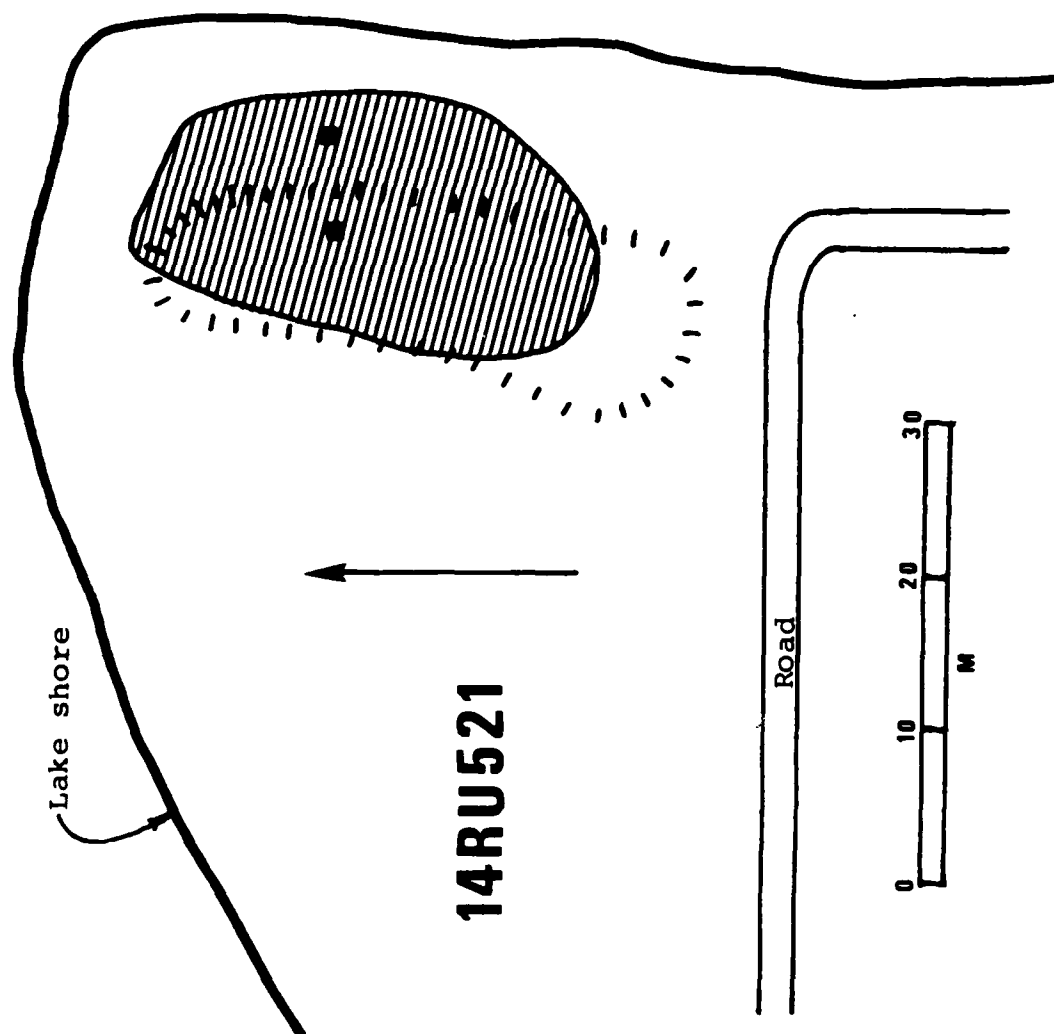


Figure 30

regions from which the inhabitants drew resources. The lithic materials allow some interesting inferences.

The pottery from the site is all of a single ware. The sherds are moderately hard, with cord-roughened surfaces and a chalky-feeling grog-tempered paste. Most surfaces are buff colored; a few are gray. Some cores are gray as well. The whole assemblage can be classified as Riley cord-roughened (Wedel 1959: 183-185).

Two rim forms are present, collared and direct. There is one collared rim in the collection. It has a cord-roughened face 19 mm high. The rim is 8 mm thick at the collar base; the lip is missing. Five other rim sherds, representing three other vessels, are all vertical and direct with cord-roughened faces. The two measurable specimens are 19 and 26 mm high. One rim tapers toward the lip; the others are parallel sided.

All but a few of the body sherds have cord-roughened exteriors. A few have smoothed-over cord-roughened exteriors, and one has a burnished surface, but traces of cord roughening can be seen on it.

Also present in the collection are daub and a few pieces of burned earth. All of the specimens are quite small, with eroded surfaces, indicating that they had been in the plow zone for a long time. This material is indicative of the former presence of a structure at the site, but it appears to have been destroyed long ago by plowing and erosion.

The lithic assemblage includes two points, one biface fragment, and four scrapers. Both of the points are broken. One, of pink Smoky Hill jasper, is missing the tip and the base. It has slightly convex blade edges. The other, of gray Florence B chert, is split lengthwise. It has a straight blade edge and base. Originally, it was about 20 mm. long.

The biface fragment is a thin piece of brown quartzite, of a variety that is found in the Oglalla formation. The flaking along the edge is rather crude. The four scrapers are each of a different material. One fragmentary specimen is of Alibates agatized dolomite. Another broken specimen is of a very fine-grained chert, but it is too heavily burned to allow identification. A stubby end scraper, also broken, is of Smoky Hill jasper. The only complete scraper is a stubby end scraper of petrified wood, probably from the Oglalla formation. It is 25 mm long and 21 mm wide.

Few of the flakes from the site show any retouch. One that does is a flake of black obsidian which shows bifacial nibbling along one edge. One of 19 pieces of brown Smoky Hill jasper has a finely retouched cutting edge. Also present are 5 flakes of Alibates agatized dolomite, 11 flakes of Florence chert, 4 flakes of unidentified cherts, 2 flakes of quartzite from the Oglalla formation, 1 flake of brown agate, 1 flake of

pink chalcedony and one flake of brown chalcedony. Larger chunks of lithic material include six specimens of brown Smoky Hill jasper, one piece of Tongue River silicified sediment, and two pieces of quartzite from the Oglalla formation.

The specimens of Smoky Hill jasper and the materials from the Oglalla formation can be found within a short distance from the site and can be considered local. Tongue River silicified sediment cannot be traced to a specific source. This material can be found over a very large region in the northern half of the Plains. Some of it has been incorporated into Oglalla sediments.

Exotic materials include five pieces of Alibates agatized dolomite from the Texas panhandle and one piece of obsidian, probably from New Mexico. They indicate either travel to that region or trade with people living there. The other identifiable exotic specimens are 11 flakes of Florence chert from the Flint Hills region east of Wilson Lake. One is a specimen of Florence A chert, from the southern end of the hills, and at least three are Florence D chert, from north of Manhattan, Kansas. Exchange with other Smoky Hill phase people living in that region is the most likely explanation for the presence of these materials in the site.

The faunal remains from the site are mostly too small and fragmentary to allow identification of species. They include 73 bone fragments, only one of which, a piece of turtle carapace, is identifiable. Most are less than 10 mm in their largest dimension. About half show signs of charring. Also present were numerous small pieces of freshwater mussel shell; none are identifiable.

Recommendations:

This Smoky Hill phase habitation site appears to have been entirely destroyed by plowing and erosion. It is currently farmed to create a food supply for wildlife in the Wildlife Refuge. Under the circumstances, there is no reason why this should not continue. No further archeological work is recommended.

Site 14RU522 (B-53)

Description:

This site consists of a very thin scatter of prehistoric lithic material and historic Euro-American trash on a high terrace on the south side of Wilson Lake. The total area is roughly 200 by 250 meters, with the longest dimension east-west. The site was divided into three areas, labelled A through C from east to west. This was actually a fairly arbitrary procedure, as there was only one object found for every 450 square meters at the site.

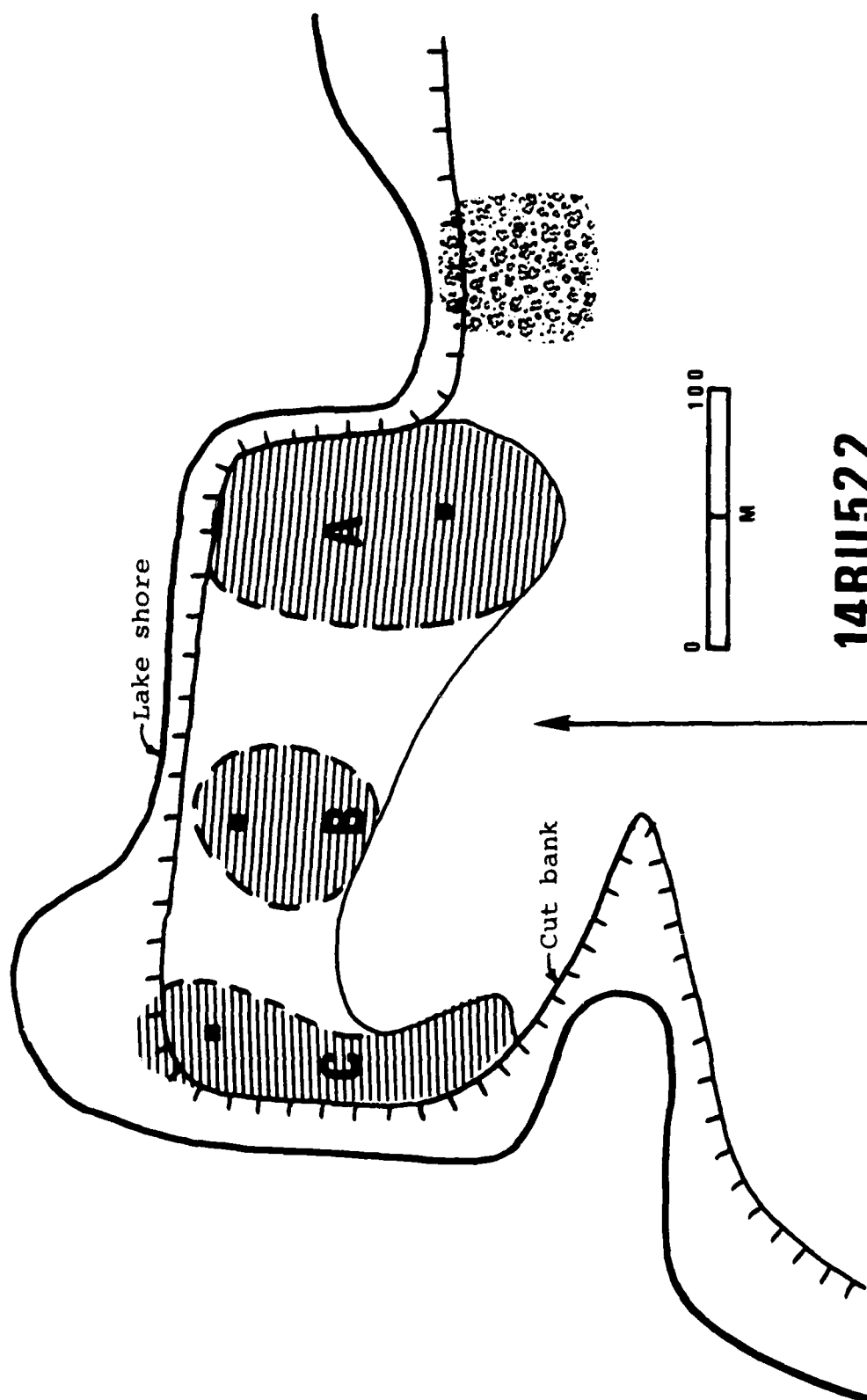


Figure 31

Testing:

Test pits were excavated wherever two lithic objects were found within 5 meters of one another. This resulted in three test pits being excavated, one in each area of the site. All measured one by two meters, and all were excavated to a depth of 40 cm. The fill from each pit was screened through window mesh, but absolutely nothing was found in the pits, even in the plow zone.

Materials Collected:

A total of 31 pieces of lithic material, presumably prehistoric, and 75 pieces of historic Euro-American material were collected from the surface. Also found were one small scrap of animal bone and a piece of burned earth; these cannot be attributed to a particular component at the site.

Concentration A yielded fine flakes, three of brown Smoky Hill jasper and two of gray cherts. One of the jasper flakes has deep unifacial nibbling on one edge. None of the rest show signs of use.

Concentration A also yielded two pieces of window glass, six whiteware and five stoneware sherds. One piece of glass is a 2.5 mm. thick piece of window glass; the other is from the base of a clear glass bottle. The whiteware sherds are undecorated; they represent at least two plates and one bowl. Four of the stoneware sherds have a dark brown glaze on the interior and a cream-colored glaze on the exterior. The remaining sherd has dark brown glaze on both surfaces. At least two large mixing bowls are represented.

Concentration B yielded six pieces of stone, of which one appears to be a naturally broken pebble. Two flakes are of Florence D chert, from the northern Flint Hills. One specimen is a flake of gray quartzite from the Oglalla formation, and two flakes are of an unidentified cream to pink-colored chert. None shows signs of use.

The same area also contained metal, glass, whiteware and stoneware sherds. The single piece of metal is a piece of thin iron sheet. Four glass specimens include one 2 mm thick piece of window glass and sherds from two transparent glass bottles. One sherd retains a portion of a fluted design created by a mold. Of 11 pieces of whiteware, three are rim sherds from three separate cups. One sherd, from a plate, retains part of a trademark that reads "IRONS[TONE]". It also pictures a standing lion, apparently part of a version of the British lion and unicorn with the royal coat of arms. The fragment does not match any of the versions depicted in Gates and Ormerod's (1982) listing of the Liverpool potters' marks. Such motifs were common from the 1880's into the 20th century (Gates and Ormerod 1982: 9). Fourteen stoneware sherds all appear to be from mixing bowls. All have dark brown glaze on the interior

and either dark brown or cream-colored glaze on the exterior.

Area C, at the west edge of the terrace, yielded the largest amount of material. Lithics included 17 flakes and two pebbles. Eight of the flakes and the two pebbles are of brown Smoky Hill jasper. There is also one red flake of jasper, with steep retouch on one edge. The origin of the other materials is not known. One of these specimens is a small fragment of a biface. This area also yielded a small lump of burned earth and a badly weathered fragment of animal bone.

Historic artifacts from this part of the site include only two pieces of metal. One is a curved sheet of 2 mm thick ferrous metal, it is probably part of a tractor tire rim. The other is a chisel, 204 mm. long, apparently hand forged. Four pieces of bottle glass include three from brown bottles and one from a transparent bottle with a bluish tint. Eighteen pieces of whiteware include pieces of plates and cups and two fragments from a china doll. Two pieces retain makers' marks, one of which is identical with the sherd from area B. Neither is complete enough for identification.

The historic site from which this material came is apparently inundated. There are some trees just east of area A that may mark its approximate location. No structures are shown in this location on any of the historic maps, however.

Recommendations:

No further work is recommended.

Site 14RU523 (B-37)

Description:

This site is located at a high spot on a ridge above the floodplain on the south side of Wilson Lake. There is a thin veneer of old river gravel on this spot, and one artifact and a few flakes were found scattered among the gravel. The area within which cultural materials were found measured 10 by 15 meters.

Materials recovered:

The single artifact recovered is an end scraper of Smoky Hill jasper. It measures 41 mm long and 20 mm wide. Also found were eight flakes of Smoky Hill jasper and four irregular chunks of the same material. The flakes may represent testing and/or reduction of jasper found in the gravels at the site. A single bone fragment is from a large mammal, possibly cow or bison.

Recommendations:

The site appears to represent a very temporary camp or workshop of unknown affiliation. No further work is recommended.

Site 14RU524 (B-34)

Description:

This site consists of a thin lithic scatter on a ridge overlooking the south (right) bank of the Saline River. A dirt road cuts across the ridge, and all of the cultural material was found in a plowed field east of the road. The lithic material was found in an area measuring 10 by 20 meters. The field here had been disked quite deeply. Soil probes indicated no cultural material below the plow zone. Instead, river sand was found immediately below the plow zone, indicating that all of the potential cultural deposits had been disturbed.

Materials collected:

A total of 13 flakes of Smoky Hill jasper were found in the 200 square meters at the site. Because all are of the same material and none show signs of retouch, the site probably represents a minor workshop. Possibly some hunters did a bit of flintknapping here while waiting to spot some game from this high vantage point. A single stoneware bodysherd found near the road is of historic Euro-American derivation.

Recommendations:

No further work is warranted at this site.

Site 14RU525 (B-43)

Description:

This is a rock-filled burial mound located on a high ridge overlooking the Saline River from the south. It was observed and recorded while crew members were investigating some petroglyphs reported by a local informant. The mound is roughly 3 meters in diameter and 0.5 meters high. There is an old pothunters' hole in the center of the mound. No cultural material was observed.

Recommendation:

The mound is remote from the high-use areas around the lake, and the old pothunters' pit will probably inhibit further damage. It is impossible to assess the damage done to the site without a major excavation. No further work is recommended.

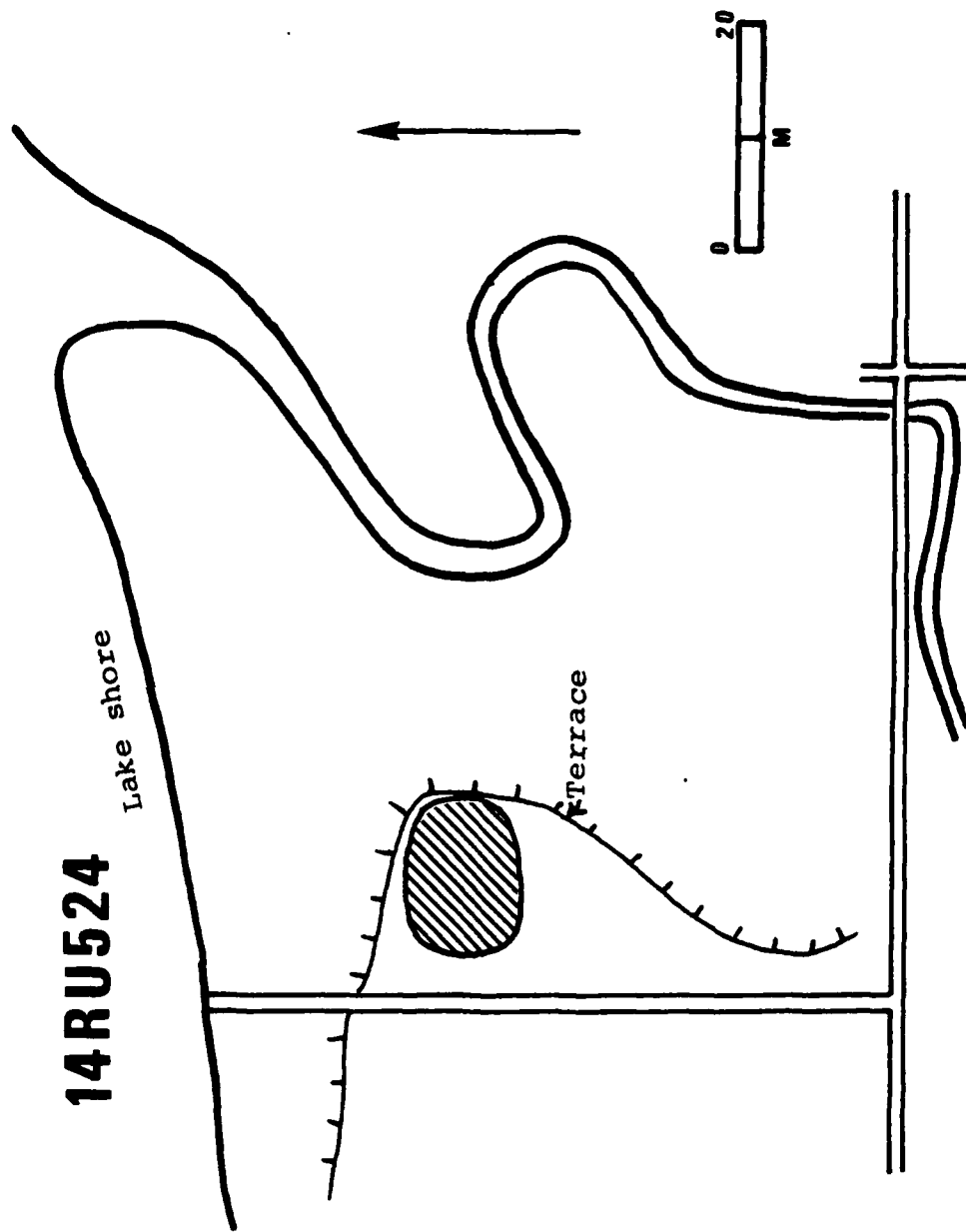


Figure 32

Site 14RU526 (B-44)

Description:

This is a large rock-covered mound on the bluffs above the south side of the lake. It is 15 meters in diameter and 0.7 meters high. There is an old pothunters pit at the center of the mound and a more recent one in the south side. Both are substantial; the one on the south is roughly 3 meters in diameter. No cultural materials were seen, and no testing was done because the mound is well outside the survey boundary.

Recommendations: No further work is recommended.

Site 14RU527 (B-81)

Description:

This is a stone-covered mound at the end of a high ridge south of Wilson Lake. It lies well outside the survey boundary. It is approximately 6 meters in diameter and 0.6 meters high. No cultural materials were visible and no testing was performed. The site was visited and recorded because it was visible from the survey area.

Recommendations:

This site should be preserved in place. It is potentially significant for future study of prehistoric human biology.

Site 14RU528 (B-63)

Description:

This is a small stone cairn located at the brow of a hill at one of the points where the Pawnee trail left the Saline River valley. It is about 2 meters in diameter and is now quite low. It is made of cobbles of the locally occurring Dakota sandstone. No cultural materials were present.

Recommendations:

The site appears to be associated with the Pawnee trail. When further study of the trail has been made, it may be eligible for the National Register as part of a thematic nomination.

Site 14RU529 (B-64)

Description:

This is another stone cairn that probably marks part of

the Pawnee trail. It lies just east of the mouth of a canyon that leads from the Saline River valley to the uplands. It is two meters in diameter and 0.4 meters high. No cultural materials were observed near the cairn, but site 14RU517 lies higher up in the canyon.

Recommendations:

The site has a fairly clear association with the Pawnee trail. It may be eligible for the National Register as part of a thematic nomination when the trail has been more thoroughly studied.

Site 14RU530 (B-59)

Description:

This site consists of a stone cairn at the end of a ridge on the south shore of Wilson Lake. Slabs of the limestone caprock and pieces of sandstone cover an area one by three meters in extent and 0.3 meters high. It is likely that this cairn has been toppled over and that it was once higher than it is today. Other cairns or mounds (14RU531 and 14RU532) exist on the highest points of land south of this site.

Recommendations:

When the Pawnee trail has been properly documented, this site, even though damaged, should be included in a thematic nomination to the National Register.

Site 14RU531 (B-75)

Description:

Site 14RU531 is the westernmost of two stone covered mounds located on a prominent pair of hills on private property south of Wilson Lake. The earthen portion of the mound appears to be about 15 meters in diameter. Limestone blocks cover the central 2 meters of the mound. It is possible that the earthen portion is a natural feature. The site was not tested because it lies far outside the survey area.

Recommendations:

The site is not on government property. It has potential significance for a study of prehistoric human biology and should be preserved in place.

Site 14RU532 (B-76)

Description:

This site is a rock-covered mound, one of a pair on high hills on private property south of Wilson Lake. It lies due east of 14RU531. It measures about 3 by 6 meters. It lies far outside the survey area and was therefore not tested.

Recommendations:

This site is not on government property. It has potential significance for study of prehistoric human biology. It should be preserved in place.

Site 14RU533 (B-67)

Description:

This site, a stone cairn, is located on the south (left) side of Hell Creek. It is 2 meters in diameter and 0.3 meters high and is composed of pieces of the local Dakota sandstone. It is close to, but considerably higher in elevation than the survey area. No cultural materials were visible, and the site was not tested.

Recommendations:

The cairn may mark access to the Pawnee trail via a side canyon. The association with the trail is not as clear for this cairn as for others. No further work is recommended.

Site 14RU534 (B-68)

Description:

This is a low stone cairn located south (left) of Hell Creek. It is on a hill above and north of 14RU305, a cave with petroglyphs. Whether the association is accidental or not cannot be determined. The cairn measures one by two meters in extent and is 0.3 meters high. No cultural material could be seen, and the cairn was not tested. It too may be associated with the Pawnee trail.

Recommendations:

No further work is recommended for this site.

Site 14RU535 (B-69)

Description:

This is another small sandstone cairn located south (left) of Hell Creek. It is at the point of a ridge at the mouth of a small side canyon that may have given access to the Pawnee trail. It measured 1.5 meters in diameter and .35 meters high. No cultural material was found, and no testing was done.

Recommendations:

No further work is recommended at this time.

Site 14RU536 (B-1)

Description:

This site consists of sets of stacked limestone fenceposts. There are three stacks of neatly piled posts, with only a few displaced posts nearby. North of these is a scatter of broken post fragments. Approximately 40 meters northeast of the latter is a pile of post fragments that has been inundated by the lake. The posts appear to have been purchased and stored for future use at this spot, as there is no quarry nearby. The site is on the north shore of Wilson Lake, on land that was once part of the Ferdinand Soukup farm (Table 22).

Recommendations:

This site is of considerable visual interest and is only a short distance from a road in a recreation area. Since the stone fence posts are a significant aspect of the cultural landscape around Wilson Lake, this complex would make the core of a fine interpretive exhibit. A sign explaining the post rock phenomenon and a low barrier to keep trucks away is all that would be needed. No one is going to carry the posts off by hand; each one weighs several hundred pounds.

Site 14RU537 (B-6)

Description:

This site consists of two concentrations of broken limestone fenceposts, with some abandoned pieces of farm machinery nearby. The site, which is on a bluff on the north side of Wilson Lake, forms part of the remains of the old Cooper Ranch. The history of the ownership of this property is the same as for site 14RU548 (Table 25).

Recommendations:

No further work is recommended for this site.

Site 14RU538 (B-8)

Description:

This site consists of two small stacks of limestone fence posts. One contains five posts and the other seven posts. They are located on either side of a boat ramp on the north

shore of Wilson Lake.

Recommendations:

This site cannot be protected against theft. Anyone who uses the boat ramp and has a pickup truck may be tempted to take some of the posts. Re-use of the posts on Corps property would be appropriate in this case. If this is done, the Department of Historic Preservation of the Kansas State Historical Society should be notified.

Site 14RU539 (B-2)

Description:

This site consists of a petroglyph containing a single historic autograph. It reads:

1878 D WISDEY

It is on a rock face on the north side of Wilson Lake.

Recommendations:

No further work is required at this site.

Site 14RU540 (B-21)

Description:

This site consists of a scatter of concrete slabs and metal trash in and on the north shore of Wilson Lake. Five concrete slabs and two limestone posts were under water at the time of the survey. Some scraps of metal, including parts of tin cans, were observed on the shore but were not collected. The material appears to come from the home of Elmer Daugherty.

Recommendations:

No further work is recommended. The site has been totally destroyed.

Site 14RU541 (B-56)

Description:

This site consists of three Native American petroglyphs on a rock face on the south shore of Wilson Lake. The petroglyphs are located only a meter or so above the present lake level.

None of the three glyphs is easy to decipher. One consists of a curved line rising from a circle with a dot in its center.

TABLE 22: OWNERSHIP HISTORY FOR 14RU536

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Frank Vondra	6/1900
Witness Deed	Frank Vondra	James Lambert	7/1930
Witness Deed	James Lambert et ux	John J. Lambert	2/1947
Witness Deed	Mary E. Lambert	Ferdinand Soukup	12/1951
Notice	U.S.A.	Ferdinand Soukup	3/1964

TABLE 23: OWNERSHIP HISTORY FOR 14RU540

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Benjamin F. Beach	5/1884
Witness deed	Benjamin F. Beach	A.B. Cross and W.J. Morgan	4/1886
Witness deed	A.B. Cross and W.J. Morgan	S. Anspaugh	7/1886
Witness deed	S. Anspaugh et ux	Harvey H. Anspaugh	3/1919
Witness deed	H. Anspaugh et ux	A.D. Jellison	1/1920
Witness deed	A.D. Jellison et ux	A.R. Buzick, Sr.	9/1920
Witness deed	A.R. Buzick, Jr. et al.	Elmer L. Daugherty	3/1943
Witness deed	Elmer L. Daugherty	U.S.A.	6/1963

Another is four straight lines drawn at various angles. The last, located on top of the rock, is a cup or depression with numerous radiating grooves. This motif is repeated at other sites.

Recommendations:

This and all of the other petroglyphs at Wilson Lake should be recorded photographically.

Site 14RU542 (B-83)

Description:

This site consists of a rock alignment on the bluff slope just east of the landing strip in Lucas Park recreation area. It was made from limestone eroding from the caprock by laying slabs in the shape of a cross. The cross is hard to see except from the area of the dam. It measures 16.5 meters high and 5.5 meters across the horizontal arm. Both vertical and horizontal arms consist of single lines of stones. The cross appears to be recent, perhaps postdating the development of the park.

Recommendations:

The alignment is located in the Lucas area but far enough away from human traffic not to be a threat to the site. No further work is recommended.

Site 14RU543 (B-4)

Description:

This site was recorded as an example of the sort of fraudulent petroglyph found frequently at Wilson Lake. It consists of the following:

Rick Thatcher Born April 23, 1756 Died April 24, 1846

It is carved on a rock in the Lucas Park area, between a road and the shoreline. The carving is still fairly fresh-looking, but when it weathers, it might fool someone.

Recommendations:

No work is recommended.

Site 14RU544 (B-29)

Description:

This petroglyph site, which may be associated with the

Pawnee trail, is on the north shore of Wilson Lake. The glyphs are carved on rocks near a set of springs. On one rock are two clear dates, 1911 and 1936. On a nearby rock are at least three Native American carvings. One is an outlined handprint. Another is a five-sided figure with a vertical line bisecting it. This is shaped something like a simple drawing of a house. The third is a diamond shape with three lines extending out from one corner and two from the opposite. Several local informants mentioned prehistoric carvings from this site.

Recommendations:

The Native American carvings should be recorded photographically.

Site 14RU545 (B-34)

Description:

This is a set of Euro-American petroglyphs on a cliff at the west end of the lake. The oldest one reads:

C.B. 1888

It is carved on a southeast facing cliff at the west end of Wilson Lake.

Recommendations:

No work is required.

Site 14RU546 (B-9)

Description:

This site consists of two alignments of limestone blocks. One is a north-south line of rocks approximately 10 meters long that abuts a rock outcrop. The other is a curving line of similar blocks connecting two low rock outcrops. Below the rocks, the ground slopes gradually to a cut bank at the lake shore. There were no clues at the site regarding age or function.

Recommendation:

No further work is recommended.

Site 14RU547 (B-12)

Description:

The site consists of a set of still standing limestone .pa

14RU546

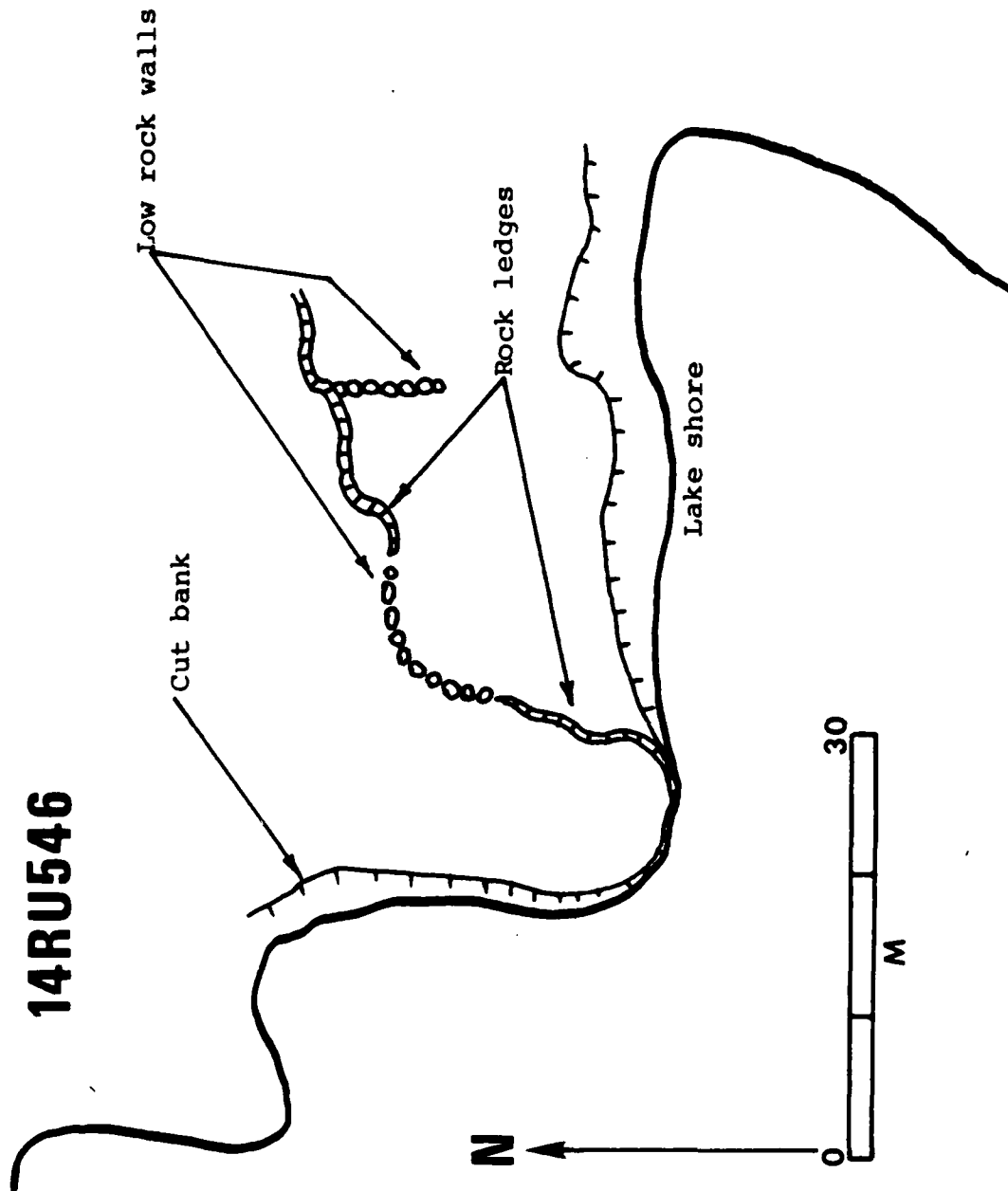


Figure 33

TABLE 24: OWNERSHIP HISTORY FOR 14RU547

Instrument	Grantor	Grantee	Date
Timber claim	U.S.A.	Galen Cooper	8/1895
Witness deed	Galen Cooper	A.G.T. Cooper	1/1906
Witness deed	Nellie P. Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Cecil F. Cooper	2/1930
Witness deed	Cecil F. Cooper	Emmett Cooper	9/1935
Witness deed	Emmett Cooper	Fred W. Heine	3/1950
Witness deed	Fred W. Heine	U.S.A.	3/1962

TABLE 25: OWNERSHIP HISTORY FOR 14RU548

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	John Q. Cooper	3/1900
Witness deed	John Q. Cooper	A.G.T. Cooper	3/1900
Witness deed	Nellie P. Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Roy D. Cooper	3/1933
Witness deed	Roy D. Cooper	Emmett Cooper	3/1933
Witness deed	Emmett Cooper	Fred W. Heine	2/1943
Witness deed	Fred W. Heine	Forrest D. Meyer	5/1957
Witness deed	Forrest D. Meyer	U.S.A.	3/1962

block walls. The blocks are chinked with concrete, and the highest stands 2 meters tall. The structure, which is partially inundated by the lake, measures 4 by 10.5 meters. It is the foundation of the original house on the Cooper Gilt Edge Ranch (Fig. 34).

Recommendations:

The area around the foundation appears to have been cleaned of historic debris. The lake shore is eroding at this point. The site should be monitored occasionally. If the trash dump associated with this early ranch house is found, it should be excavated.

Site 14RU548 (B-16)

Description:

This site is the remnant of the second farmstead built on the Cooper Ranch. Most of the site now under water; the location of the shelter belt trees can be seen from shore. On shore are a stone fence, a windmill, and some limestone posts associated with the remains of a building foundation.

Recommendations:

No further work is recommended. The site is essentially gone.

Site 14RU549 (B-77)

Description:

This is the site of the Meyer farm, purchased by the government when Wilson Lake was created. It now consists of the house foundation, the foundation of a chicken house, a rubble-filled cistern, and a concrete well pad. The house foundation which measures 7 by 9.5 meters is surrounded by rubble created when the house was bulldozed. The same sort of rubble, ceramic brick and cement, has been used to fill the 2 meter diameter brick-lined cistern. A concrete slab well pad with an iron cover is 5 meters from the house foundation. The hen house foundation, which measures 1.5 by 6 meters, is of poured concrete.

Recommendations:

The site was thoroughly demolished at the time the lake was created. No work is recommended here.

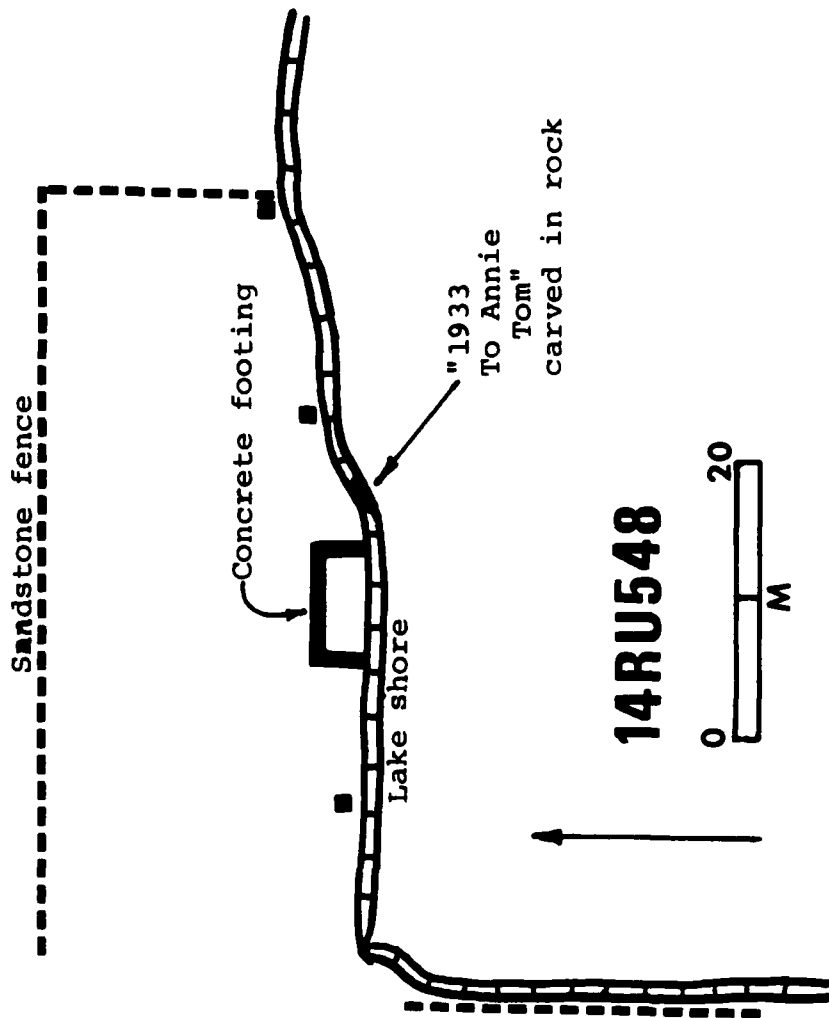


Figure 34

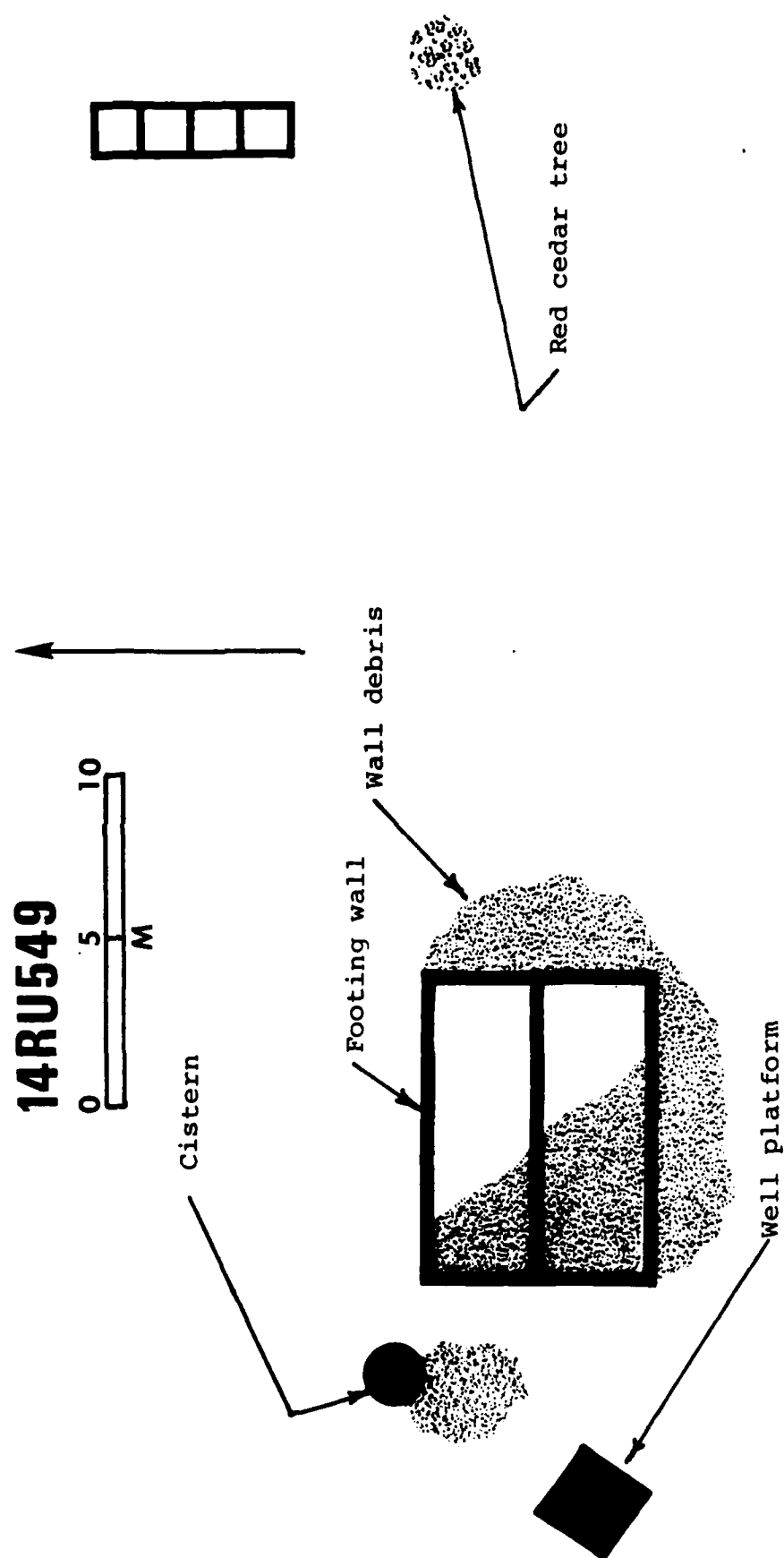
TABLE 26: OWNERSHIP HISTORY FOR 14RU549

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	John A. Cooper	3/1900
Witness deed	John A. Cooper	A.G.T. Cooper	3/1900
Witness deed	Nellie Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Roy D. Cooper	3/1933
Witness deed	Roy D. Cooper	Emmett Cooper	3/1933
Witness deed	Emmett Cooper	Fred W. Heine	2/1943
Witness deed	Fred W. Heine	Forrest D. Meyer	5/1957
Witness deed	Forrest D. Meyer	U.S.A.	3/1962

TABLE 27: OWNERSHIP HISTORY FOR 14RU550

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Benjamin F. Taylor	10/1881
Witness deed	John Taylor	Lutie Sawhill	5/1931
Witness deed	Lutie Sawhill	U.S.A.	9/1962

Figure 35



Site 14RU550 (B-17)

Description:

This is a partially inundated foundation of an historic structure. It is on the north shore of Wilson Lake. The foundation, of cemented blocks of postrock, measures 4 by 6 meters. There is a small extension, of the same materials and 1.5 meters square, at the northeast corner of the larger foundation. Six limestone fenceposts lie on the shore north, east, and south of the foundations. The only artifacts noted were fragments of some ceramic electrical insulators. This is the remains of the Lutie Sawhill house, which was demolished when the lake was created.

Recommendations:

As with the other historic houses around the lake, this was demolished and the associated artifacts bulldozed away in the 1960's. No further work is recommended.

Site 14RU551 (B-22)

Description:

This site is what remains of the Ralph Goodheart farmstead. This site was so thoroughly bulldozed that even the size and orientation of the house foundation cannot be determined. All that remains of the house are a scatter of postrock blocks and pieces of cement. A rubble-filled depression appears to be the remains of a root cellar.

Recommendations:

No further work.

Site 14RU552 (B-24)

Description:

This is the foundation wall of an historic structure. It consists of a single course of postrock blocks forming a square 10 meters on a side. It was on the Rogg Ranch, but the tract map does not show a structure in this spot. It may have supported a barn that supplied the north part of the Rogg Ranch, as the main buildings were south of the river. The ground around the foundation is clear of historic debris.

Recommendations: No further work is required.

TABLE 28 OWNERSHIP HISTORY FOR 14RU551

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Union Pacific	7/1888
Witness deed	Union Pacific	Belle D. Brown	1/1893
Administrator's deed		T.M. Cooper	4/1893
Witness deed	T.M. Cooper	Earl J. Missimer	6/1905
Witness deed	E.J. Missimer et ux	Ira E. Missimer	12/1916
Witness deed	I.E. Missimer et ux	Frank and J.E. Missimer	6/1924
Witness deed	F. Missimer et ux	J.E. Missimer	10/1934
Witness deed	J.E. Missimer et ux	Ralph W. Goodheart	2/1949
Notice		U.S.A.	8/1962

TABLE 29: OWNERSHIP HISTORY FOR 14RU552

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Franklin McKanna	4/1882
Witness deed	F. McKanna et ux	Thomas McKanna	12/1883
Witness deed	T. McKanna et ux	Levi Wilhelm	1/1886
Witness deed	L. Wilhelm et ux	B.M. Davies	12/1889
Witness deed	B.B.Davies et ux	J.I.McCauley et al	4/1891
Witness deed (1/2)	DeWitt Hubbard	Nellie M. Jones et al	4/1895
Quit claim	Nellie Jones et vir	William J. Rickards	5/1896
Quit claim	Dewitt Hubbard et ux	William J. Rickards	5/1896
Witness deed	W.J. Rickards	F.S. Rockefeller	12/1900
Witness deed	F.S. Rockefeller	Gertrude Frederickson	12/1927
Witness deed	Gertrude Frederickson	Geo. Frederickson et al	10/1940
Witness deed	George Frederickson	Raymond H. Rogg	7/1949
Witness deed	Sally Frederickson et al	Raymond H. Rogg	7/1949
Witness deed	R.H. Rogg et ux	U.S.A.	3/1962

Site 14RU553 (B-32)

Description:

This site is an old farmstead. The yard, 25 by 30 meters, is defined by fences. Inside the fencing are two limestone and concrete foundations. The smaller one measures 5 meters square, while the larger one is 15 metres square. North of the yard and between it and an old road is a stand of trees. It is the site of the Emma Harsch home, which was demolished in the 1960's.

Recommendations:

Like most of the other historic sites, this one was thoroughly cleaned out. No further work is recommended.

Site 14RU554 (B-38)

Description:

This historic farmstead consists of a house foundation, a standing outhouse, and some structural remains in a wooded ravine. The house foundation, which measures 10 meters square is marked today by scattered limestone blocks. A corral (?) seems to have been built in a wooded ravine north of the house. On the south side (and inside) the ravine, there is a rock wall approximately 20 meters long. On the north side, there is another wall 15 meters long. Projecting south from this wall to the center of the ravine is another wall which connects at right angles to two more, forming a rectangular enclosure that measures 6 by 9 meters, with an opening in the northern end of the east end that is 4.5 meters wide.

Recommendations:

No further work is recommended.

Site 14RU555 (B-41)

Description:

This historic farmstead has the best-preserved plan of any of those within the survey area (Fig. 36). Situated on a high terrace near Cedar Creek, it contains the foundations of four structures. Each structure was oriented to the cardinal directions, but they were aligned in zig-zag fashion with the axis oriented ENE-WSW. At the back of the farmstead was the steep cut bank of Cedar Creek, protected by a wire mesh fence.

At the west end of the yard was a small (1.8 m. square) structure. Five meters further east and with its back wall

TABLE 30: OWNERSHIP HISTORY FOR 14RU553

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Union Pacific	10/1890
Witness deed	Union Pacific	Edw. Eberhard	9/1900
Witness deed	R.H. Steward et ux	U.S.A.	7/1962
Witness deed	Emma Harsch	U.S.A.	7/1962
Witness deed	Charles Boyle, administrator	U.S.A.	7/1962

TABLE 31: OWNERSHIP HISTORY FOR 14RU554

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Union Pacific	10/1890
Witness deed	Union Pacific	Thos. McKanna	11/1883
Witness deed	Thos. McKanna	Jonas F. Wolf	8/1892
Witness deed	J.F. Wolf	A.A. & W.J. Huseman	11/1937
Witness deed	A.A. Huseman	W.J. Huseman	1/1943
Witness deed	W.J. Huseman	U.S.A.	10/1963

aligned with the back wall of the first structure was a large (6 by 21 m) building, probably a barn. Two meters north and 9 meters east of northeast corner of the barn was another building, the west end of the foundation of which was a large concrete slab. This was probably a garage or shed. It measures 7 by 11.5 meters. The last structure, apparently the house, is 4 meters farther east. It is marked by a large depression, indicating the presence of a cellar. It measures about 5 meters by 7 meters. At the northeast corner, there is a 3-meter-long projection of the depression to the north. This probably a storm cellar.

Mature honey locust trees now grow from the house depression. There is another very large honey locust north of the barn, and there is a line of six small (1.2 m square) concrete slabs leading from it toward the barn. This walk terminates, however, 9 meters north of the barn. Well pipes emerge from the ground between the house and barn. The entry to the farmyard seems to have been in the northwest corner. Traces of the old road can be observed at this point. It joins a vacated section line road at the west end of the section.

The site is the remains of the Raymond Rogg Ranch headquarters.

Recommendations:

This site is remote from visitor traffic. Although it does not have National Register significance, every effort should be made to preserve what is left. It is the best example left at Wilson Lake of the organization of a Smoky Hills ranch.

Site 14RU556 (B-47, B-48)

Description:

This site on the south shore of Wilson Lake is all that remains of the Carl Missimer farm. The old farm road is well preserved, but the farm is not. The most substantial remains are the trees from the farmstead. Limestone blocks from building foundations are now so widely scattered that the locations of the structures cannot be determined. They are strewn, along with a few scraps of metal and glass and whiteware sherds, over an area that measures 20 meters north-south and 35 meters east-west.

At a distance of 150 meters to the south, in a field heavily overgrown with grass, a few rotten planks were found. These may mark the site of a small outbuilding.

A single flake of red Smoky Hill jasper was found on the beach east of the farm site. This appears to have washed ashore, as there were no other indications of a prehistoric

14RU555

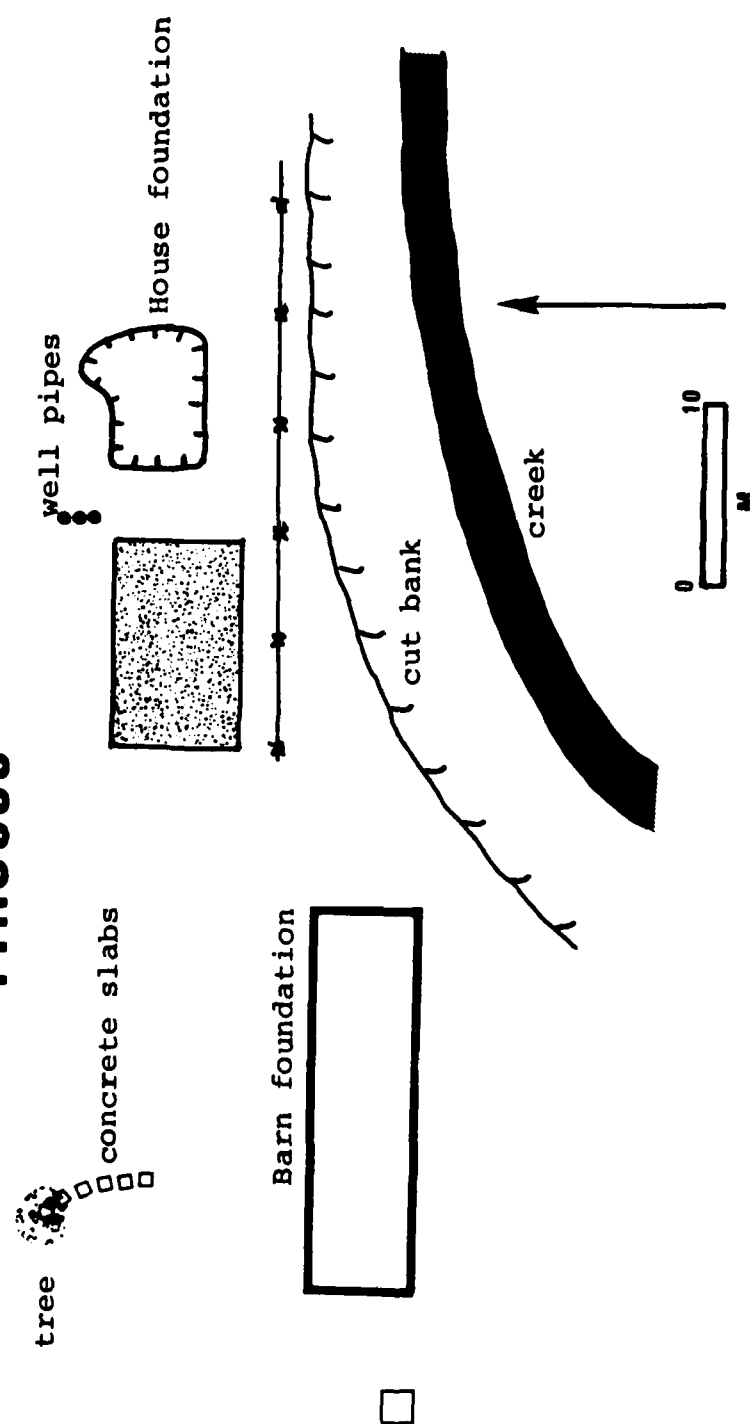


Figure 36

TABLE 33: OWNERSHIP HISTORY FOR 14RU556

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Wesley G. Hatton	4/1882
Witness deed	Wesley G. Hatton	Ralph Goodheart	8/1948
Sheriff's deed	Ralph Goodheart	J.E. Missimer	3/1949
Quit claim	Glenn Missimer et ux	Vera B. Stivers	2/1958
Quit claim	Glenn Missimer et ux	Carl Missimer	2/1958
Notice		U.S.A.	3/1964

TABLE 34: OWNERSHIP HISTORY FOR 14RU557

Instrument	Grantor	Grantee	Date
Timber claim	U.S.A.	heirs of Isodore Heller	8/1892
Witness deed	Theodore Heller	S.G. & A.P. Buck	11/1891
Witness deed	A.P. Buck et ux	Stewart G. Buck	10/1897
Witness deed	Stewart G. Buck	A.P. Buck et ux	4/1912
Witness deed	A.P. Buck et ux	George N. Borden	2/1919
Witness deed	G.N. Borden et ux	John Henry Hake	5/1921
Witness deed	Frank H. Hake et ux et al	U.S.A.	6/1962

TABLE 33: OWNERSHIP HISTORY FOR 14RU556

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Wesley G. Hatton	4/1882
Witness deed	Wesley G. Hatton	Ralph Goodheart	8/1948
Sheriff's deed	Ralph Goodheart	J.E. Missimer	3/1949
Quit claim	Glenn Missimer et ux	Vera B. Stivers	2/1958
Quit claim	Glenn Missimer et ux	Carl Missimer	2/1958
Notice		U.S.A.	3/1964

TABLE 34: OWNERSHIP HISTORY FOR 14RU557

Instrument	Grantor	Grantee	Date
Timber claim	U.S.A.	heirs of Isodore Heller	8/1892
Witness deed	Theodore Heller	S.G. & A.P. Buck	11/1891
Witness deed	A.P. Buck et ux	Stewart G. Buck	10/1897
Witness deed	Stewart G. Buck	A.P. Buck et ux	4/1912
Witness deed	A.P. Buck et ux	George N. Borden	2/1919
Witness deed	G.N. Borden et ux	John Henry Hake	5/1921
Witness deed	Frank H. Hake et ux et al	U.S.A.	6/1962

occupation.

Recommendations:

No further work is recommended.

Site 14RU557 (B-49)

Description:

This is the site of an historic farmstead which was owned by Frank H. Hake prior to reservoir construction. The site lies just above the lake shoreline, with some debris extending out into the lake. No buildings have any walls still standing, but at least three concentrations of bricks and cement blocks show the apparent former locations of buildings. Materials such as cement steps and brick indicate that this was in use fairly recently.

Recommendations:

Since all structures have been totally destroyed and there is no indication of use in the early historic period, no further testing or preservation is recommended at this site.

Site 14RU558 (B-50)

Description:

This is marked by two heavily sodded-over depressions. Shovel testing in the bottom indicates a jumble of limestone blocks. A shallow linear depression extending away from the site to the west apparently marks a former access road to the site. The two depressions were apparently either dugouts or basements from the early historic period. Both are dug into a sloping hillside so that they could have been entered from the east at ground level. The dense sod cover indicates they were abandoned well before reservoir construction. They are high enough above lake level that they are not in danger from shoreline erosion. The area is not developed. An adjacent area is occasionally used for recreation such as fishing and swimming so there is some potential for damage from digging or exploring by the public.

Recommendations:

This site has some potential for useful information on the early historic period, but it is fairly well protected by its low visibility and relatively low public useage. We therefore recommend that this site be preserved in place, with no further testing necessary at this point.

TABLE 35: OWNERSHIP HISTORY FOR 14RU558

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Thos. J. Olds	6/1883
Witness deed	T.J. Olds et ux	W.N. Lindsay	8/1883
Witness deed	W.N. Lindsay	E. Werk	4/1884
Witness deed	E. Werk et al	Frank Missimer	1/1911
Witness deed	F. Missimer et ux	J.E. Missimer	10/1934
Witness deed	J.E. Missimer et ux	Ralph W. Goodheart	2/1949
Witness deed	R. W. Goodheart et ux	U.S.A.	8/1962

TABLE 36: OWNERSHIP HISTORY FOR 14RU559

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Union Pacific	10/1890
Witness deed	Union Pacific	Charles Smith	5/1885
Witness deed	C. Smith et ux	W.H. Reed	10/1888
Witness deed	W.H. Reed et ux	Doretta Smith	3/1890
Sheriff's deed		Chas. P. Copeland	3/1891
Quit claim	C.P. Copeland et ux	Central Kansas Loan & Trust	10/1893
Assignee deed	Central Kansas Loan & Trust	Dana M. Dutch	6/1895
Witness deed	Dana M. Dutch	John Hake	9/1899
Witness deed	F.H. Hake et ux	U.S.A.	6/1962

Site 14RU559 (B-52)

Description:

This is a historic site marked by limestone blocks outlining a rectangular foundation and scattered rubble. An associated well and water tank with galvanized steel components indicate this site was used in a comparatively recent part of the historic period. Prior to reservoir construction, the site was owned by Frank H. Hake.

Recommendations:

Since the site appears to have no particular historic significance, and all structures have been completely leveled, no further testing or preservation is recommended.

Site 14RU560 (B-54)

Description:

This is the site of an historic farmstead owned by N. V. Maybrier prior to construction of the reservoir. It consists of four concentrations of limestone and concrete. In most cases, part of the foundation walls are still intact. In one, a concrete floor is still mostly intact, but no walls are standing. The lake shoreline passes through the site and parts are inundated; erosion is actively destroying the site. Metal, cans, and bottles indicate relatively late occupation of the site.

Recommendations:

Since the site appears to have no unusual historic significance, and all of the structures have been leveled, no further testing or preservation is recommended.

Site 14RU561 (B-57)

Description:

This site consists of an historic stone fence made up of red sandstone blocks. There is a rectangular alignment of the same material attached which may represent a building foundation. There are two limestone posts inside the foundation. The height of the sandstone wall ranges from .5 to 1.25 meters. The limestone posts are lower than the surrounding walls and may have been interior floor supports. No other cultural material was found to indicate an age other than historic.

TABLE 37: OWNERSHIP HISTORY FOR 14RU560

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Hiram B. Hatton	5/1884
Witness deed	H.B. Hatton et ux	Samuel Shilts	4/1884
Witness deed	Samuel Shilts et ux	Samuel Anspaugh	12/1900
Witness deed	Samuel Anspaugh et ux	Harvey Anspaugh	3/1919
Witness deed	Harvey Anspaugh et ux	Nettie L. Dougherty	3/1936
Quit claim	Earl Anspaugh et ux	Nettie L. Dougherty	7/1934
Witness deed	Lee V Anspaugh et ux	Nettie L. Dougherty	3/1938
Witness deed	N.L. Dougherty	N.V. Maybrier et ux	5/1953
Notice		U.S.A.	5/1963

TABLE 38: OWNERSHIP HISTORY FOR 14RU561

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Nathan I. Sherman	10/1899
Witness deed	Nathan Sherman	Chrissie S. Bunting	11/1899
Witness deed	Chrissie Bunting	Charles A. Shaeffer	12/1899
Witness deed	Charles Shaeffer	Chrissie S. Bunting	4/1901
Witness deed	Chrissie Bunting	Arthur D. Jellison	5/1904
Witness deed	Arthur Jellison	Charles G. Small	11/1904
Witness deed	Charles Small	A.G.T.Cooper	12/1906
Witness deed	Nellie P. Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Lucian Cooper	2/1930
Witness deed	heirs	M.R.E. Cooper	5/1948
Witness deed	M.R.E. Cooper	U.S.A.	6/1962

Recommendations:

The site appears to have no unusual historic significance although there is some possibility it was in use quite early in the historic period. No standing structure remains and no historic artifacts are on the surface. No further work other than preservation in place is recommended.

Site 14RU562 (B-60)

Description:

This is part of an historic farmstead which belonged to Frank Polcyn prior to reservoir construction. It consists of a windmill, a sandstone fence, and three farm implements. Any building foundations have apparently been inundated by the lake. The fence runs west to east, extending into the lake.

Recommendations:

The site appears to have no unusual historic significance. There are no visible remains of any buildings that may have once been there. Therefore, no further testing or preservation is recommended.

Site 14RU563 (B-7)

Description:

This site consists of the foundations of several historic structures and a set of three depressions that mark the location of another structure or structures. They are located on a terrace on the north side of Wilson Lake. In the center of the complex is a concrete slab, 2 m on a side with a 15 cm diameter hole in the center. It appears to be a well pipe. The slab adjoins a building foundation made of crudely shaped limestone slabs. It measures 2 by 5 meters. It represents a former dwelling that faced south to the river. South of the well pad are three shallow depressions, each about one meter in diameter. They are too close to the house for outhouse pits, and probing with an Oakfield coring device yielded no cultural material.

There were no cultural materials on the surface at this site. Apparently, it was graded when the recreation area was created. The buildings were probably part of the Cooper Ranch, which included this section of land.

Recommendations:

No further work is recommended for this badly disturbed site.

TABLE 39: OWNERSHIP HISTORY FOR 14RU562

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Kansas Pacific R.R.	3/1869
Witness deed	Union Pacific	William K. Schaeffer	11/1875
Witness deed	Mattie Schaeffer	Franklin Schaeffer	10/1876
Witness deed	Franklin Schaeffer	Chas. Schaeffer	2/1885
Witness deed	Charles Schaeffer	Chrissie Bunting	10/1895
Witness deed	Chrissie Bunting	Jessie K. Nelson	8/1936
Witness deed	Jessie K. Nelson	Frank Polcyn et al	5/1950
Witness deed	Frank Polcyn et al	U.S.A.	3/1962

TABLE 40: OWNERSHIP HISTORY FOR 14RU563

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Edwin Huntsberger	11/1880
Witness deed	Edwin Huntsberger	John E. Landis	11/1880
Witness deed	John E. Landis	L.P. Waddick	11/1883
Sheriff's deed		J.H. Goodsell	6/1891
Witness deed	J.H. Goodsell	Guy C. Biggs	3/1893
Witness deed	Guy C. Biggs	A.G.T. Cooper	1/1930
Witness deed	Nellie P. Cooper	Emmett Cooper	1/1930
Witness deed	Emmett Cooper	Samuel E. Cooper	2/1930
Witness deed	Oliver Cooper	U.S.A.	

Site 14RU564 (B-74)

Description:

The site is an historic farmstead with portions of three buildings remaining. Two are dugouts with walls made of sandstone or sandstone/limestone combination. These are both dug into a south-facing hill-slope with the back wall totally underground and the south or front edge of the floor even with the surface. One is 6 meters square and the other 5.5 x 6 meters. The third building is represented by a rectangular sandstone foundation 3 x 4.5 meters. The faint trace of an old access road entering from the south along a quarter section can be seen. The site is well back from the shoreline and faces no danger from lake erosion. It is in a secluded valley with few visitors likely to cause any disturbance to the site.

Recommendations:

This site has some potential for useful information on the early historic period, but it is well protected by its remote location and fairly low visibility. We therefore recommend that the site be preserved in place, with no further testing necessary at this time.

Site 14RU565 (B-31)

Description:

This site consists of a low wall of limestone blocks across a small draw. This is probably an historic check dam. It is approximately 8 meters long and .5 meters high.

Recommendations:

The structure appears to have no unusual historic or architectural significance. Therefore, no further testing or preservation efforts are recommended.

Site 14RU566 (B-28)

Description:

This site consists of two short sandstone walls across a small tributary canyon with a small cave nearby. The cave was 1 x 2 x 1 meters with no other cultural material in association. The more upstream wall was approximately 10 meters long, up to 1 meter high, fairly intact. The lower one was about 15 meters long, badly disrupted. These could be stone fences to block off the canyon to livestock or possibly check dams.

TABLE 41: OWNERSHIP HISTORY FOR 14RU564

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Charles F. Kuchera	3/1908
Witness deed	Charles Kuchera	William L. Nesmith	3/1908
Witness deed	William Nesmith	Caroline Borell	9/1931
Witness deed	Caroline Borell	Fred W. Heine	7/1946
Witness deed	Fred W. Heine	Robert Drylie et ux	9/1947
Notice	Robert Drylie et ux	U.S.A.	2/1962

TABLE 42: OWNERSHIP HISTORY FOR 14RU568

Instrument	Grantor	Grantee	Date
Patent	U.S.A.	Charles A. Casper	3/1888
Witness deed	Charles A. Casper	Arlene Kimball et al	11/1947
Witness deed	heirs of Arlene Kimball	C.E. Casper	11/1948
Notice	C.E. Kasper	U.S.A.	2/1962

Recommendations:

The site appears to have no unusual historic significance, and no further testing or preservation effort is recommended.

Site 14RU567 (B-33) Success Cemetery

Description:

This site is an historic cemetery outlined with native limestone fenceposts. Human remains and tombstones were relocated prior to reservoir construction. A pile of 2.5 x 15 cm boards in central northwest portion was apparently a small frame building. Stone fence posts also define former roads running along the north and east sides. There are gravel pits dug to the east and west. A local resident told us that two limestone blocks located just outside of the cemetery boundaries, to the northeast, were former tombstones. We could find no markings on these blocks.

Recommendations:

There is no indication that this site has any remaining historic significance. Since all human remains and tombstones have been relocated, no further testing or preservation is recommended.

Site 14RU568 (B-87)

Description:

This is an historic farmstead which has been inundated by the lake. This was on the Casper property before lake construction. All that is visible now is a square concrete septic tank and some other stray pieces of concrete just below the lake surface.

Recommendations:

There is no indication of this site having any unusual historic value. Since it has been leveled and is now inundated, no further testing or preservation is recommended.

Site 14RU569 (B-88)

Description:

This is a petroglyph site, with many historic carvings and at least two probably prehistoric glyphs. These two are on facing rocks. One is a square with a vertical line through it. Witty (1962) recorded similar designs in Hell Creek Canyon. The other glyph is rectilinear with two diagonal lines issuing

from it. It may be a stylized zoomorphic figure. Below it is a dashed line. This site lies just east of site 14RU12.

Recommendations:

The Native American carvings should be recorded by photography.

Site 14RU570 (B-61)

Description:

This is an historic farmstead with belonged to the Weinhold family prior to reservoir construction. At least five concrete and native sandstone foundations and some sidewalks are present. One foundation has "Hen and Rooster House" inscribed in the cement. Part of the site has been inundated by the lake and no walls remain standing.

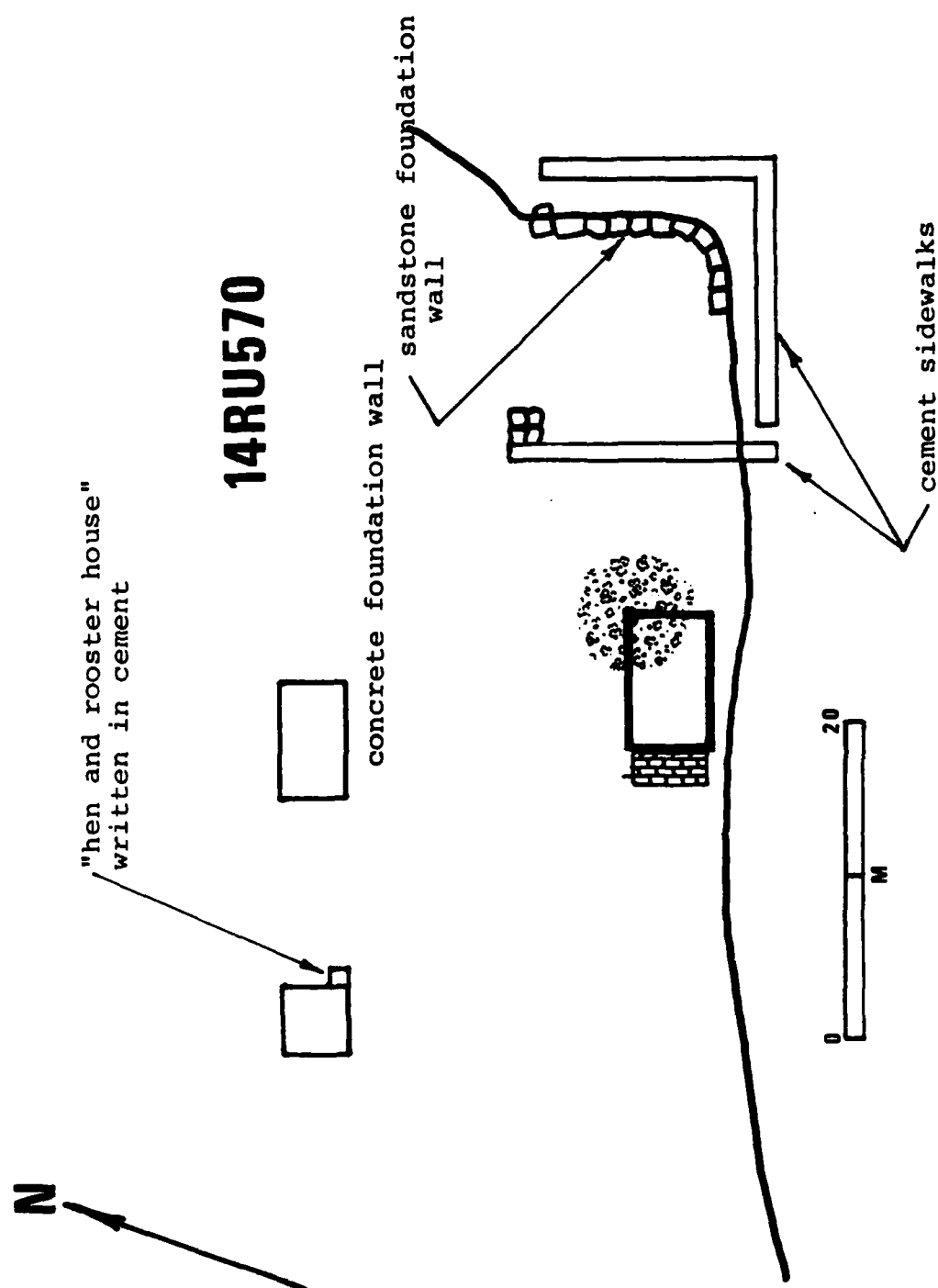
Recommendations:

This site appears to have been in fairly recent use and there is no indication of any particular historic significance. Since all buildings have been leveled, no further testing or preservation is recommended.

TABLE 43: OWNERSHIP HISTORY FOR 14RU570

Instrument	Grantor	Grantee	Date
Patent	State of Kansas	Olive A. Erickson	8/1901
Witness deed	John Erickson et ux	Augustus P. Ruppenthal	4/1913
Sheriff's deed		Central Trust Co.	8/1937
Witness deed	Central Trust Co.	Penn Mutual Life Insurance Co.	9/1937
Witness deed	Penn Mutual	Ray Shaffer	6/1938
Witness deed	Ray Shaffer et al	Ollie V. Ruppenthal	3/1945
Witness deed	Ollie V. Ruppenthal et ux	Henry G. Weinhold et ux	5/1945
Notice		U.S.A.	2/1962

FIGURE 37



IX.

CONCLUSIONS

Summary

The 1985 survey of the shoreline of Wilson Lake yielded, for the area covered, relatively few sites. Prehistoric habitation sites were particularly scarce. The return in numbers of prehistoric sites was so low, in fact, that some of the research questions around which the project design was constructed remain effectively unanswered. Others, however, were answered in ways that contribute significantly to the culture history of the region.

The two research questions addressed most successfully are geomorphology and cultural landscapes. The geomorphologist was able to demonstrate that most of the land surfaces exposed at Wilson Lake are late Holocene in age, dating to the last two millennia. This result explains the paucity of early archeological sites. Except for burial mounds on high landforms, early sites are deeply buried, and most of the landforms likely to contain these sites are inundated.

A further result of the geomorphological study is the correlation of the alluvial sequence and paleosols with others in the Central Plains. In this context, they help in the interpretation of the climatic history of the region. This in turn will eventually help in the interpretation of the cultural adaptations.

Bozarth's phytolith analysis represents a pioneering effort for the region. The matching of the phytolith and geomorphological samples accomplished here should be repeated in other localities. The phytolith analysis indicates fairly little climatic change of the sort that is reflected in the composition of grass communities. At the spot studied, a fair amount of sensitivity to environmental change was expected. This is so because it is a slight rise that supports a mixed grass community but is in the middle of a tall grass community. Fluctuations between tall grass and mixed grass communities were not documented, however. Instead, the present-day mixed grass community appears to have had a long history, with only minor fluctuations in composition.

The study of cultural landscapes was most successful in connection with the Pawnee trail. Extensive documentation demonstrates the importance of this cultural feature to the early history of the region. The apparent association of prehistoric sites with the trail is intriguing but cannot at present be demonstrated to be the result of a causal relationship. Nevertheless, all of the stone cairns found at Wilson Lake are in the vicinity of the trail. All but one of

the few prehistoric habitations sites are near the trail. So is the densest concentration of prehistoric petroglyphs, although this last pattern is less pronounced than the others.

Study of the historic cultural landscape proved less successful in terms of the archaeology. Its most obvious features are the ubiquitous limestone fenceposts. Posts stacked for future use were found at several locations. Standing fences, although often with modern steel fenceposts interspersed, were everywhere.

Other aspects of the historic landscape were far less well preserved, and the historic ranches and farmsteads were so thoroughly eradicated when Wilson Lake was constructed that the vernacular architecture and internal arrangements of the ranches and farms could not be studied.

Except for the documentation of the early history of the region, this survey adds little to our understanding of the culture history of the region. No PaleoIndian or Archaic period sites were found. Several mounds recorded may be Early Ceramic in age; all of them lay outside the survey area as defined in the contract. One site, 14RU521, proved to be a Middle Ceramic habitation site of Smoky Hill phase affiliation. Another, 14RU519, appears to be a Great Bend campsite. None of the other prehistoric sites found during the survey could be assigned a definite cultural affiliation. Historic Euro-American sites were numerous, but most of them have been so thoroughly disturbed that they are not amenable to study.

The analysis of site location, type and function was severely limited by a lack of data. Of the 18 prehistoric sites found prior to 1985, only one had not been excavated, destroyed or inundated. This site is a burial mound that lies just outside the survey area. Of the 33 sites recorded in 1985, six were mounds. One had been destroyed, and the other five were outside the survey area.

Six of the sites found were stone cairns. These are the first such sites to be documented in the Wilson Lake area. All appear to be associated with the Pawnee trail. Fourteen sites recorded were petroglyphs, some of which may also be associated with the trail. Three sites were temporary camps or workshops, while only one was a habitation site. None contained undisturbed deposits of any significance.

Only one archeological radiocarbon date was obtained, for a cave (14RU514) that contains some petroglyphs. The date, 960 \pm 60 years B.P. (Beta 14137), is indicative of a Middle Ceramic age for the hearth in the cave. This may be associated with the faint petroglyphs on the walls of the cave. No samples appropriate for archeomagnetic or thermoluminescent dating were obtained. The hearth at 14RU514 was in sand, which will not produce reliable archeomagnetic determinations. Aside from the single flake found at 14RU514, all of the cultural

materials found at all of the sites were obtained from either the surface or the plow zone. Such samples are not amenable to thermoluminescence dating.

With such a paucity of sites, it was not possible to study site location decisions. Only two patterns are worthy of note in this regard. One is the placement of all but one of the burial mounds on the ends of high ridges and hills. The other is the apparent association of many of the sites with the Pawnee trail.

Study of lithic and ceramic provenance was limited to the single habitation site, 25RU521. In spite of the fact that no cultural deposits were found below the plow zone, enough material was recovered to obtain an idea of the territory being exploited, however indirectly, by the inhabitants of the site. The lithics, but not the pottery, were helpful in this regard. The grog-tempered pottery is not indicative of manufacture in any particular spot. It is diagnostic, however, of a Smoky Hill phase affiliation.

The only lithic item from the site that indicates an eastern connection is a point of Florence B chert, from the Flint Hills. A much stronger connection with the Southwest is indicated by an end scraper and five flakes of Alibates agatized dolomite from the panhandle of Texas and a flake of obsidian, presumably from New Mexico. These account for 14 percent of the lithic items from the site. All but nine of the remaining lithic items are of Smoky Hill jasper or of materials from the Oglalla sediments. All could have been obtained fairly locally or from a wide region west of the site. All of the nine unidentified stone items could also have come from the Oglalla formation; it contains a wide variety of chippable stone.

The inhabitants of 14RU521 thus drew the bulk of their lithic resources from the region around and to the west of the site, with the addition of a significant proportion from far to the southwest. It will be of real interest to see how this pattern compares to that in other Smoky Hill phase sites.

Recommendations

The entity within the project area with the greatest historical significance is the Pawnee trail. The documentation provided in this report is sufficient to indicate that the trail is of significance, not merely to local and regional history, but to national history. There is no doubt that it should be on the National Register of Historical Places.

Nomination is not recommended at this time, however. The field study provided by the survey of Wilson Lake touched on only a small portion of the trail. The trail, as defined herein, ran from central Nebraska to the Great Bend of the

Arkansas River. Its exact route between these spots has not yet been researched, hence it is impossible to nominate the whole trail.

To nominate the section of the trail at Wilson Lake would be unacceptably arbitrary. The section of the trail at the lake is not visible on the ground. There are sites at Wilson Lake that are associated with the trail. The most definitely associated are the cairns, 14RU528, 14RU530, and 14RU529. Also likely to be associated are the burial mound, 14RU311, the petroglyph sites, 14RU515 and 14RU517, and some of the campsites. Proof of association with the trail will require survey of other areas, both at points where the trail crosses other streams and at points away from crossings. Only then will it be possible to demonstrate that these sites are associated with the trail rather than being accidentally juxtaposed to it. When such a study has been completed (and one will be proposed to the Kansas State Historical Preservation Officer), a thematic nomination involving well-preserved sections of the trail and associated sites will be in order.

In the meantime, the state may wish to recognize one aspect of the history of the trail at Wilson Lake. The analysis provided above indicates that Zebulon Pike crossed the Saline River precisely where the Wilson Lake dam is located. Currently, there is no monument to the expedition at this spot, but there is one at the Kansas Monument village on the Republican River. Unfortunately, Pike never visited this village but instead stopped at one in southern Nebraska. Creating a monument to Pike at Wilson Lake could be a first step in correcting this long-perpetuated error. It would also have the advantage of being at a spot that receives far more visitors than the relatively isolated Kansas Monument site.

Two petroglyph sites at Wilson Lake are recommended for inclusion in the existing thematic nomination of petroglyph sites in the state. They are 14RU517 and 14RU505, both of which contain fairly well-preserved Native American petroglyphs. The paperwork necessary for nomination of the sites is included in an appendix to this report.

Recording all of the petroglyphs at Wilson Lake should not be difficult or expensive. This survey has recorded in a preliminary fashion all of those along the lake shore and some that are at a distance from the shoreline. The other rock faces and caves that might contain petroglyphs are limited to narrow side canyons that run down to the lake from the uplands. A survey of all of the canyons would not be terribly expensive, since each one could be covered adequately simply by walking up and back. This could be done with a two-man crew.

We had far better luck than we expected in photographing even faint petroglyphs. If the surveyors used a strobe light to illuminate all of the petroglyphs at a low angle of light incidence and used a string grid or other scale to frame the

petroglyphs, all of them could be recorded clearly on black and white photos and on color slides. This, along with an analysis of the styles and motifs, would constitute adequate mitigation for these cultural resources. It is not likely that they can be preserved in place, however. Recent visitors have inscribed their initials over Indian petroglyphs and have tried to remove others. Natural erosion is removing the rest at varying speeds depending on the hardness of the rock and the exposure.

None of the other sites found during the survey have the integrity, historical significance, or potential to yield scientific information that is necessary for eligibility to the National Register. The historic farmsteads were all disturbed badly by the contractor who demolished the buildings. Local informants said that front end loaders and bulldozers were used to clean surface debris from these sites and to bury the same. This removed much of the evidence regarding layout and use of these sites.

The survey reported here did not cover all of the Corps property at Wilson Lake. The contract specified that a complete survey along the lakeshore be completed, and this was done. Various circumstances, however, forced us to go outside the survey boundary on occasion, and when we did, numerous sites were found. Sites were especially common in the side canyons leading to the river valley, and future work at Wilson Lake should include survey of all these spots.

We also recorded all of the areas of the lakeshore that are being eroded, as opposed to being stable or subject to deposition. This information is provided on a set of topographic maps in the appendices. Patterns of shoreline erosion and deposition are determined by lake bottom contours and prevailing wind patterns. The areas being eroded in 1985 can therefore be expected to continue to erode, and it is these areas that should be monitored for exposure of now-buried sites. Future shoreline surveys can be restricted to these areas, as new sites will not be exposed in areas of shoreline deposition or stability.

Research questions for the Future

It is expected that the sort of research reported here will not only be organized according to existing research interests but will also develop new research questions to guide future research. Two primary sets of research questions can be posed as a result of the work performed at Wilson Lake. Two others not tied specifically to Wilson Lake can also be suggested.

The first set of research questions involves the Pawnee trail. The documentation provided in this report demonstrates that the trail is of the utmost importance to the early history of Kansas and surrounding states. There is a great

deal, however, that we do not yet know about it. How old is it? Did it develop after the creation of the large Pawnee villages in central Nebraska, or are the locations of those villages in part a response to the previous existence of the trail? Which sites are actually associated with the trail and which are merely juxtaposed to it by accident of history? Which of the sites that are associated with it should be nominated to the National Register? Are there any spots where portions of the trail are still visible features of the landscape?

The second set of research questions concern the Native American petroglyphs at Wilson Lake and at other spots in Kansas. What are the basic themes represented in this art? Examination of J.R. Mead's manuscript drawings suggests that at least three basic themes were present at the Circle Rock site: self-depiction of individual warriors and war parties, depictions of successful hunts, and representations of religious ideas and deities. What are the meanings of the various motifs, such as the deep cup with radiating lines? How widely are these motifs distributed in the Great Plains? Can any motifs or stylistic elements be identified with particular tribes or ethnic groups? Taken as a set, all of the petroglyph sites at Wilson Lake could contribute significantly to our understanding of Plains Indian art.

Another topic, and one that does not involve Wilson Lake directly, is the Butterfield trail, which ran south of the lake but north of the Smoky Hill River. The creation of this stage line and its maintenance in the face of determined Indian resistance is one of the most exciting episodes in Kansas history. The various stations along the trail should be documented and appropriate ones nominated to the National Register. This is properly the responsibility of the State Historic Preservation Officer rather than the U.S. Army Corps of Engineers.

A final topic is that of the preservation of the rural landscape. The Post Rock country around Wilson Lake is one of the most distinctive rural landscapes in the country. During the survey, we looked for examples of farmsteads that might be appropriate for nomination to the National Register but found none. The contractor who had removed existing structures when Wilson Lake was created had done too thorough a job.

Preservation of the landscape, however, must go beyond nomination of individual buildings to include all of the important aspects of the landscape, including the postrock fences, stone walls, and the like. How such preservation of a significant portion of the landscape might be accomplished is a difficult problem. Neither it is unique to the postrock country. Other regions, such as the Flint Hills, retain a distinctive character deserving of protection. That protection may require new strategies if the rural way of life as well as the landscape is to be preserved.

GLOSSARY

A HORIZON - The uppermost, dark, and carbon-rich layer of a soil.

ALLUVIAL - In reference to soil deposits; deposited by water.

ARCHAIC - A time period in the prehistory of Kansas, from 7500 B.P. to 2000 B.P.

B.P. - Before present; used with radiocarbon dates with a base time of A.D. 1950.

CACHE - Goods deposited in a storage pit.

CHERT - A type of silica-rich rock used by Native Americans for chipping stone tools. What most people mean when they say "flint".

CRETACEOUS - A geological time period, 65 to 136 million years ago.

DIRECT RIM - An unthickened rim on a ceramic vessel. This is the most common type found in Kansas. Thickened rim forms include collared, braced and S-rims.

EARLY CERAMIC - A time period in the prehistory of Kansas, 2000 to 1000 years B.P.

FACIES - A local expression of a geologic deposit that differs in some minor way from other facies in the same deposit.

GEOMORPHOLOGY - The study of landforms.

HOLOCENE - A geological time period, from about 10,000 years ago to the present.

IETAN - A term used by some early sources to refer to all or part of the Comanche tribe.

JASPER - A silica-rich rock used by Native Americans for stone tools.

LAITAN - A variation of the term, Ietan. Refers to the Comanche tribe.

LATE CERAMIC - A time period in Kansas prehistory, roughly 1500 A.D. into the historic period.

LEAGUE - A unit of measure used by French and Spanish explorers; roughly 2.5 to 3.0 miles.

MESIC - Refers to a moist climatic regime.

MIDDLE CERAMIC- A time period in Kansas prehistory, A.D. 1000-1500.

PADOUCA - A term used by early explorers to refer to the Plains Apache and/or Comanche.

PALEOINDIAN - A time period in Kansas prehistory; prior to 7500 B.P.

PALEOSOL - An old buried soil horizon. A paleosol represents a stable land surface that was later buried.

PANIMAHA - A french term for the Skiri Pawnee.

PETROGLYPH - A design that has been pecked or carved (not painted) on a rock.

PHASE - A unit in an archeological classification, corresponding roughly to a tribe.

PHYTOLITH - A particle of opal formed inside a plant. Some phytoliths are diagnostic of particular kinds of plants.

RADIOCARBON - A dating technique in which the level of remnant radioactivity in organic material (usually charcoal) is used as a measure of age.

SHEETWASH - Gradual erosion of sediment from the whole land surface, as opposed to gullying.

SKIRI - A band of the Pawnee tribe, also spelled Skidi.

TERRACE - A land form that represents a remnant of an old river valley.

VOYAGEUR - A French fur trader.

WHITEWARE - A term that includes all forms of historic white hard pottery such as porcelain and bone china.

XERIC - Refers to arid climatic conditions.



PLATE 1. Petroglyphs at 14RU503. Several similar petroglyphs exist in different locations at Wilson Lake and Kanopolis Lake.

PLATE 2. Petroglyphs at 14RU10 are now partially underwater; other sites are now completely underwater.





PLATE 3. Cave in canyon, 14RU517; petroglyphs being recorded from rock face.

PLATE 4. Rock town, 14RU544, with petroglyphs on standing sandstone outcrop.





PLATE 5. Some of the historic foundations, 14RU570, were easy to map.

PLATE 6. While other historic foundations, 14RU310, were overgrown with trees and small bushes, making mapping difficult.





PLATE 7. Small stone bridge, 14LC506, still in use, south of Otoe
Park area.

PLATE 8. Cave at 14RU514 was tested and charcoal was obtained for a C-14 date sample.





PLATE 9. East wall of test pit excavation, 14RU514, showing possible hearth remains 20-30 cm below surface.

PLATE 10. Example of mounds, 14RU525, found in association with the Pawnee trail.



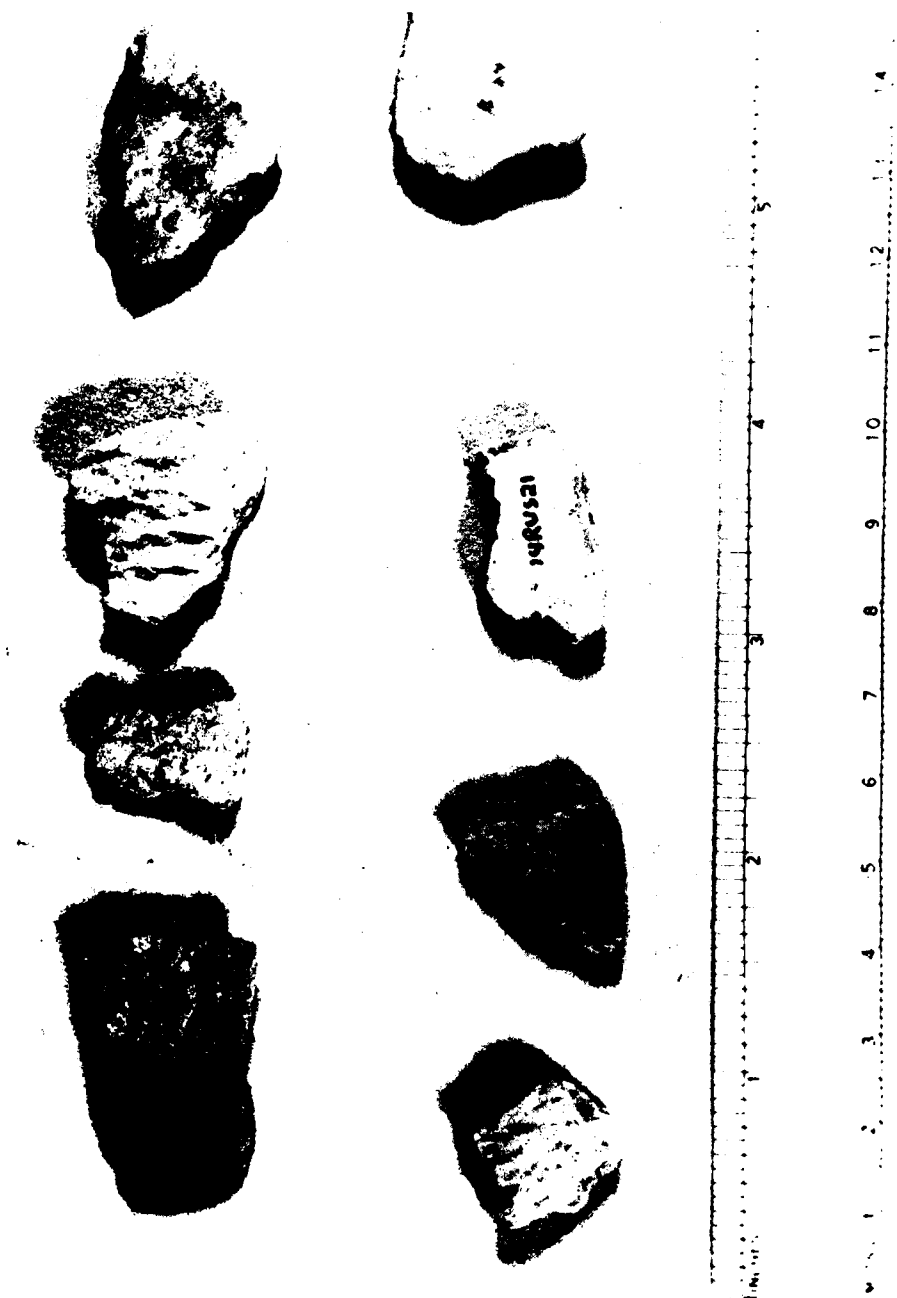


PLATE 11. Cord-roughened sherds of jars and bowls discovered at
14RU521

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ALONG THE PAWNEE TRAIL: CULTURAL RESOURCE SURVEY AND
TESTING AT WILSON LAKE KANSAS(U) BLAKESLEE (DONALD J)
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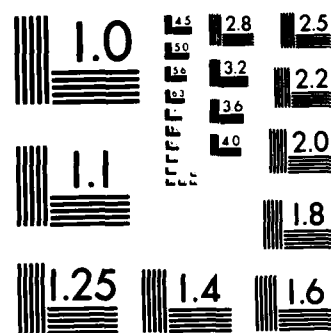
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